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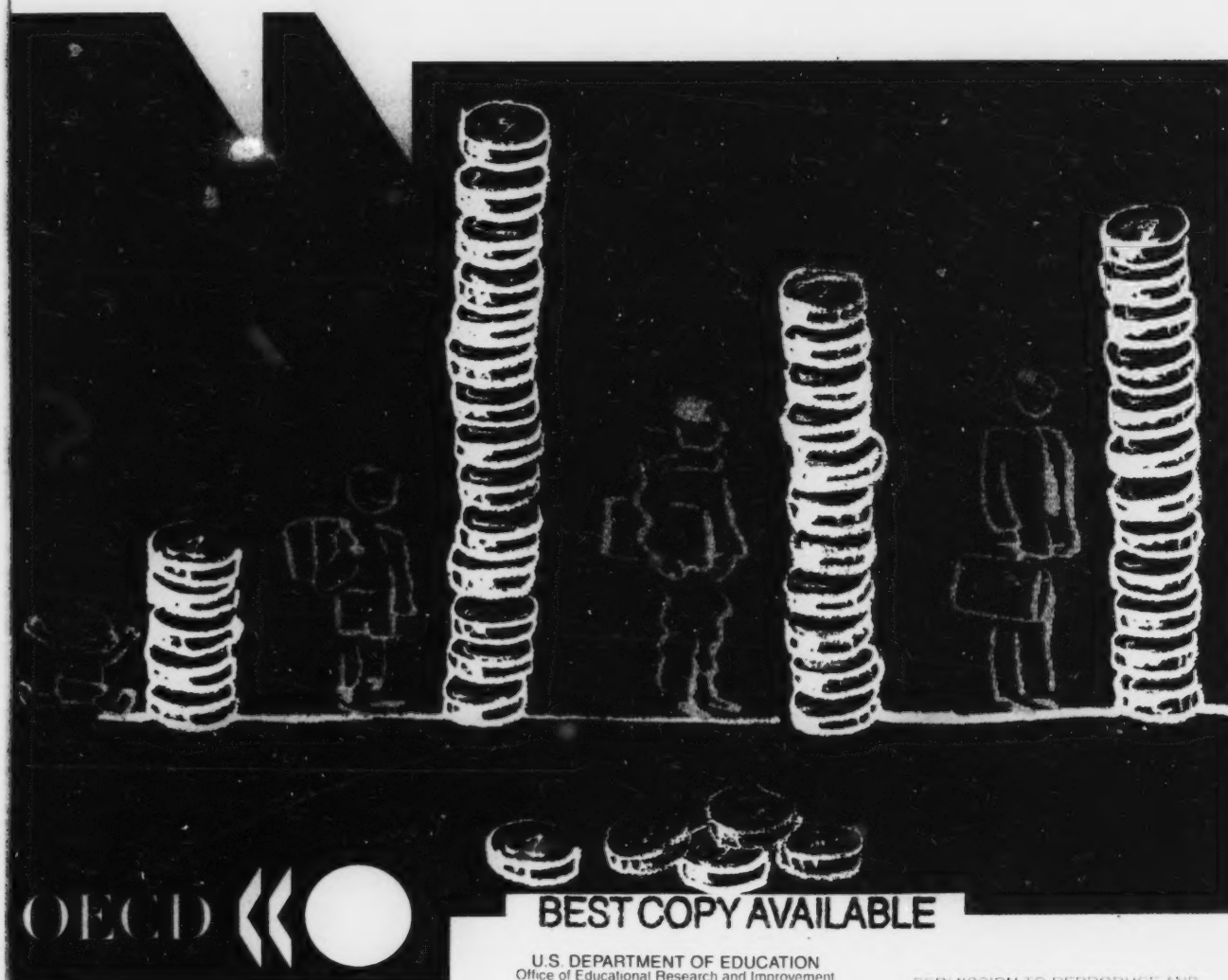
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ABSTRACT

This book represents one result of the international conference on "Lifelong Learning as an Affordable Investment," held December 6-8, 2000 in Ottawa, Canada. It examines the economic and financial issues that arise in implementing lifelong learning and considers how the public and private sectors are actually addressing or might address them. Information for the six-chapter book was drawn from analyses, findings, and lessons from various components of the Organization for Economic Cooperation and Development's (OECD's) work on financing lifelong learning, as well as from material from the Organization's thematic reviews on early childhood education and care, transitions from education to work, tertiary education, and adult learning. Chapter 1 lays out the broad questions that the report is intended to address. Chapter 2 analyzes the important economic and social factors behind the drive for lifelong learning, identifying some current gaps and imbalances that these trends have caused. Chapter 3 begins to establish a framework for a funding strategy source of funds, size of the task, and rationale for government intervention. Chapter 4 examines the costs and benefits of learning at different stages of the life cycle, suggesting reforms and identifying ways in which costs may be reduced and benefits increased in the future, thereby strengthening incentives to invest in lifelong learning. Chapter 5 highlights general funding issues relevant to lifelong learning and examines possible new funding mechanisms. The final chapter examines ways in which policy thinking will need to change to meet the lifelong learning challenge. A summary of the proceedings from the conference is appended. (Contains 81 references, 25 figures, 17 tables, and 6 boxes.) (KC)

Economics and Finance of Lifelong Learning



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Foreword

In December 2000, the OECD and Human Resources Development Canada organised in Ottawa an International Conference on "Lifelong Learning as an Affordable Investment", in order to provide a forum in which public policy-makers, employers, and trade unions could debate three broad questions related to society's investment in lifelong learning:

- What resources are likely to be required in order to make lifelong learning for all a reality?
- Under what conditions can that goal be made more affordable to society?
- What is the role of public policy in helping to meet those conditions?

This report addresses these same issues. It examines the economic and financial issues that arise in implementing lifelong learning, and considers how the public and private sectors are actually addressing or might address them. An earlier version was prepared to provide a basis for the debate in the conference. It drew on analyses, findings, and lessons from different components of the Organisation's work on financing lifelong learning, as well as relevant material from the Organisation's thematic reviews on early childhood education and care, transitions from education to work, tertiary education, and adult learning. After the conference, it was revised to incorporate information concerning recent initiatives and policies. The report also includes a summary of the proceedings of the conference as an annex to this volume.

Chapter 1 lays out the broad questions that the report is intended to address. Chapter 2 analyses the important economic and social factors behind the drive for lifelong learning, identifying some current gaps and imbalances that these trends have caused. The following chapter begins to establish a framework for a funding strategy, asking where the funds should come from, discussing some methodological questions related to the size of the tasks to be achieved and discussing some theoretical and practical issues relating to the rationale for government intervention. Chapter 4 examines the costs and benefits of learning at different stages of the life cycle, suggesting reforms and identifying ways in which costs may be reduced and benefits increased in the future, thereby strengthening incentives to invest in lifelong learning. Chapter 5 highlights general funding issues relevant to

lifelong learning and examines possible new funding mechanisms. The final chapter examines ways in which policy thinking will have to change to meet the lifelong learning challenge.

This report was prepared by Dr. Donald Verry of the Department of Economics, University College London, United Kingdom, in consultation with Gregory Wurzburg and Abrar Hasan of the OECD Secretariat. The report benefits from the input of OECD Member countries into the Organisation's activity on Alternative Approaches to Financing Lifelong Learning, and from the efforts of the Canadian authorities who co-hosted, with the OECD, the International Conference on "Lifelong Learning as an Affordable Investment".

This report is published on the responsibility of the Secretary-General of the OECD.

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Chapter 1

Strategies to Make Lifelong Learning an Affordable Investment

1. Introduction

Lifelong learning is a necessity for individuals to ensure their integration into the economic, social and cultural mainstream. Lifelong learning *for all* is necessary to ensure economic, social and cultural cohesion.

When they met in 1996, OECD Education Ministers adopted a mandate to make lifelong learning a reality for all. In so doing, they underlined the importance of learning throughout the lifecycle, and the necessity of public strategies to make learning opportunities accessible to all (OECD, 1996a). As Member countries have taken steps to implement this ambitious mandate, they have been confronted with challenging questions about how to best meet the needs of different learners; how to enrich the quantity and diversity of learning opportunities, without sacrificing quality and equity objectives; how to measure and recognise outcomes from non-formal learning; and how to ensure that diverse aspects of public policy do not work at cross purposes to each other, or to the learning goals of individuals.

One of the most complex challenges relates to resources. In contrast to other far-reaching reforms or new initiatives in education, the lifelong learning mandate changes many parameters at once. It implies quantitative expansion of learning opportunities; qualitative changes in the content of existing educational activities; qualitatively and quantitatively different learning activities and new settings; and changes in the timing of learning activities in the lifecycle of individuals. These developments imply, in turn, a strong likelihood of changes in the costs of providing and participating in education, training and learning activities, and increases in the total outlays by society for such activities. Constraints on and competition for public resources combined with the presence of substantial private returns to certain aspects of lifelong learning imply a need to increase the private share of the overall finance burden.

These and other issues were the subject of an international conference held in Ottawa, Canada in December 2000 on the theme "Lifelong Learning as an Affordable Investment". The conference was co-hosted by the OECD and Human

Resources Development Canada. A summary of proceedings appears as an annex to this report, an earlier version of which served as a background paper for the conference. The broad aim of the current version, which incorporates some conference feedback, remains to address the resource issues that arise as Member countries implement lifelong learning for all.

2. Taking a strategic approach to resource issues

To implement strategies for lifelong learning, policy-makers and social partners need to agree on what they mean by "lifelong learning", and then, ultimately, address three resource questions:

- What resources are likely to be required in order to make lifelong learning for all a reality?
- Under what conditions can the mandate be made affordable to society?
- What is the role of public policy in helping to meet those conditions?

Yet the policy- and decision-making processes and the analyses underlying them are neither neat nor straightforward. Resource issues cannot be approached in isolation from one another as they are highly interdependent. Inevitably, a society's vision of lifelong learning is conditioned by its costs and who bears them, factors that are themselves influenced by policy and institutional arrangements.

This paper raises a series of discrete questions, and addresses them in the context of different "sectors" in which lifelong learning occurs. Each of these questions is outlined below:

- *How does lifelong learning affect past assumptions and practices regarding who pays for learning?* Pre-school education and care is publicly financed in part or in whole in some countries. Publicly financed initial education is universally available at least through upper secondary education; at the tertiary level, it is publicly financed in part or whole, depending on the country. Labour market training for the unemployed is publicly financed. Lifelong learning may shift the usual balance between public and private funding of learning. Pre-school education and care should ideally be universally available in order to ensure that children begin school ready to learn. How might this affect the public vs. private responsibilities for financing? In a lifelong learning perspective, initial education can be seen as something that should be accessible at anytime over an individual's life. Can there be publicly financed entitlements to such learning, regardless of age? Lifelong learning occurs in a greater variety of settings than formal education, many of them non-public. What does this imply for who pays? As learning becomes more common for adults, what criteria should be applied in deciding who pays?

- *How does lifelong learning increase the opportunity for enhancing cost-effectiveness of provision of learning, and increasing its benefits?* Lifelong learning implies an increase in the total volume of learning and, at least in the medium term, the financial resources devoted to it. Successful implementation of lifelong learning strategies depends on strengthening the incentives for public and private investment in learning, *i.e.*, increasing benefits relative to costs. So far, strategies for lifelong learning, often in tandem with other measures (to improve quality of education outcomes, for example), have had positive effects in this regard. Thus, attempts to integrate vocational training and academic studies can improve the quality of upper secondary qualifications, and rationalisation of teaching personnel may reduce unit costs. What are the most important factors that drive economic and non-economic costs and benefits of lifelong learning in various sectors? What approaches show promise for reducing costs (*e.g.* relaxing barriers to entry of new learning providers, use of ICT), and raising benefits (recognition of informal learning, stronger link between lifelong learning outcomes and wage setting in collective bargaining)?
- *What mechanisms facilitate financing of lifelong learning, either out of future benefits or past earnings of employers and individuals, or out of public resources?* Strong incentives to invest in *lifelong* learning are not enough to stimulate such investments if actors do not have access to financial resources. In finding financial resources it is necessary to address the interdependency between investments made at different points in the lifecycle. There are limits to how practical this is, since much of initial education is publicly supported, and much of subsequent learning is privately supported. But there is potential for progress in rationalising the public and private shares separately. For example, on the public side, consolidation of allocations for different levels of education, and decentralisation of allocation decisions might facilitate re-allocation of resources across different levels of education. On the private side, greater accessibility of loans with income-contingent repayment might make it less risky for young persons as well as adults to borrow capital to finance the costs of tertiary education and further training. For working adults and retired persons who are adverse to financing learning through loans, individual learning accounts might allow them to defer some portion of pre-tax income during high earning years, to pay the costs associated with acquiring new qualifications or pursuing leisure courses during retirement. What is being tried? What are the pros and cons of options being considered?
- *What mechanisms and processes make it easier to address the resource issues that cut across ministries and the public and private sectors?* It is difficult to make coherent decisions about resources for lifelong learning because the factors that

directly and indirectly affect the incentives and finance for investment in lifelong learning are found in different ministries, and cut across the public and private sectors. In addition to decisions concerning the allocation of resources across levels of education (referred to above), they include decisions concerning the allocation of resources for labour market training and other "non-education" policies that involve human resource development. They also include factors as diverse as the tax treatment of expenditure on early childhood education and care (ECEC), and on adult training; the stance of competition policy regarding barriers to entry of non-traditional education and training providers; telecommunication infrastructure and fees; capital market disclosure policies regarding human resource development by enterprises; and the treatment in collective bargaining of knowledge and know-how acquired by individuals through lifelong learning. Many of these issues require comprehensive, multidisciplinary approaches to documenting and analysing particular problems, and for communication channels and consultation processes that involve all relevant actors. How are governments and social partners dealing with these difficulties?

3. Structure of the report

Chapter 2 analyses some of the economic and social factors behind the drive for lifelong learning, identifying some current gaps and imbalances that these trends have caused. Chapter 3 begins to establish a framework for a funding strategy, asking where the funds should come from, discussing some methodological questions about the size of the tasks to be achieved and discussing some theoretical and practical issues relating to the rationale for government intervention. Chapter 4 examines what we know about costs and benefits of learning at different stages of the life cycle, suggesting some reforms and highlighting ways in which costs may be reduced and benefits increased in the future. Chapter 5 highlights some general funding issues relevant to lifelong learning and examines some possibilities for identifying new funding mechanisms. Chapter 6, which is more speculative than the preceding chapters, examines some ways in which policy thinking will have to change to meet the lifelong learning challenge.

Chapter 2

Economic and Social Forces Driving the Lifelong Learning Initiative

1. Introduction

Economic and social forces currently confronting all OECD countries have increased economic inequality, perceived job insecurity and, in some cases, poverty and social exclusion. In addition, there have been major sectoral reallocations of labour. For many workers the nature of jobs have changed. Most governments would accept that these developments require some policy response. A lifelong learning strategy is potentially one of the most effective of such responses. Potentially, retraining, upgrading and renewal of skills become even better investments than in the past.

A conjunction of economic and social forces underpins the current impetus to lifelong learning in OECD countries. Whether these circumstances are historically unprecedented is debatable. However, except in the unlikely event of these trends reversing themselves of their own accord, lifelong learning represents probably the most effective way of offsetting some of the more harmful effects of the interrelated forces of technical change, globalisation and sectoral shifts in consumption and production.

The renewed interest in the concept of lifelong learning receives some of its impetus from characteristics of the "new labour market". We identify and discuss some of these characteristics¹ in the sub-sections which follow, and then attempt to evaluate important gaps and shortfalls faced by OECD countries in the light of these developments.

2. Growing inequality

Over the last three decades or so the distribution of wage earnings and employment has become more unequal.² In particular the position of less qualified workers has deteriorated markedly. There is a vast literature on these questions (see note 1 for some references) and many alternative ways to document it. This is not the place to summarise this literature. Glyn and Salverda (2000) argue

convincingly that employment rates at different levels of the educational distribution, and changes in such rates, provide the best index of the relative positions of skilled and unskilled workers. Table 1 illustrates the disadvantages of the less educated and the changes in their relative position (for males). The table also shows percentage changes in relative wages as measured by annual percentage changes in the D9/D1 decile ratio.

Table 1. **Employment and earnings inequality in selected OECD countries**

	Employment rates by educational quartile, 1994					Wage dispersion (D9/D1) % change per year	
	Women		Men			1980s	1990s
	Q1	Q4	Q1	Q4	Q4-Q1 % change, 1981-1994		
Canada	40.8	77.4	64.2	86.3	4.5	1.5	-1.4
Denmark	55.5	85.6	65.7	87.6	8.2	0.1	
Finland	50.9	77.1	54.6	80.3	10.7 ¹	0.8	-1.3
France	40.5	72.4	60.5	85.0	6.4	0.3	-0.8
Germany (95)	37.4	70.9	71.1	88.2	9.5 ¹	-0.6 ²	0.9 ²
Italy	20.1	63.3	60.6	84.7	13.0 ¹	-0.1	1.1
Netherlands	30.1	70.9	66.6	86.9	1.5	1.3	1.6
New Zealand	46.3	75.7	67.5	90.3	15.2	2.1	2.1
Norway	56.2	86.1	72.9	90.9	6.7	-0.4	
Spain	22.9	57.3	63.6	80.8	8.6		
Sweden (96)	63.6	87.0	73.1	87.2	-5.2 ¹	0.3	1.3
UK	52.0	79.0	65.1	88.3	13.2	2.2	0.7
US	51.2	79.9	70.1	90.6	1.4	2.1	0.9
Japan			89.6	97.6	2.2 ¹	0.9	-0.3

1. Finland, 1982-1994, Germany, 1980-1995, Italy, 1980-1994, Japan, 1979-1982, Sweden, 1981-1994.

2. West Germany.

Sources: Glyn and Salverda (2000), Glyn (2000).

There are marked differences in employment rates for the least and best educated quartiles. These differences are greater for women than for men (and more variable across countries), probably reflecting, in the main, the greater proportionate increase in economic activity for educated women. Also noteworthy is the fact that these employment rates and their quartile differences are not very different in the US and Europe; greater wage flexibility in the US did not markedly reduce joblessness among the least qualified, relative to the European experience. In terms of changes in employment inequality (for men), experience is mixed. Many countries experienced an increase in inequality of between 6% and 15%, but Sweden, the US,³ Japan and the Netherlands experienced reduced inequality or only small increases. In terms of earning inequality, the US, UK, Canada and New Zealand experienced large

increases in the 1980s. Continental European inequality did not increase nearly as much. In most countries the trend to greater inequality was less strong in the 1990s, with Germany, Italy and Sweden being major exceptions.

While there are other contributory causes, it is now quite widely accepted that the empirical evidence points to shifts in the pattern of labour demand being the main cause of this growing inequality.⁴ Demand has shifted away from unskilled and semi-skilled workers towards highly skilled (and rewarded) workers. These demand shifts have outweighed supply shifts in the same directions. In some European countries, where wages are less flexible than the US or UK, these demand shifts generate large increases in unemployment among the unskilled. In turn, demand shifts are commonly explained by skill-biased technical change, whereby output is most efficiently produced using higher ratios of skilled to unskilled labour than previously. Thus, substitution towards skilled labour has taken place within industries rather than reflecting, primarily, the decline of less skill-intensive industries. Much of this technical change is of course related to the pervasiveness of information and communications technology (ICT), largely but not exclusively in the service sector of the economy. The high skills that skill-biased technical progress rewards are not purely the technical skills associated with ICT, because the successful application of ICT in many applications requires organisational change and innovation (in both product and process) within the workplace. As well as technical skills, skill-biased technical places a premium on flexibility, adaptability, problem-solving and managerial skills.

Whatever the ultimate causes of widening differentials, the changes are profound and to reverse them by policy interventions would be immensely costly. By way of example, Heckman (1999) has made a back of the envelope calculation for the US of the investment cost, in 1989 dollars, of restoring 1979 earnings ratios between lower education groups and college graduates without reducing the 1989 earnings of college graduates. To restore real earnings for both male and female workers over the age of 25 that are high school educated or less to their 1979 relativity with college graduate earnings (holding the latter constant at the 1989 level) would require an investment of 1.66 trillion 1989 dollars. The cost would be greater if under-25s and the economically inactive were included. These calculations assume a rate of return to human capital investment of 10%. As these are very optimistic rates for low skilled and for older workers and for individuals on government training programmes, these calculations probably underestimate the cost of reversing the increase in the US skill differential since 1979. In terms of numbers of persons, Heckman calculates that, for a 1990 workforce, about 5.4 million persons would have to be transformed to college graduates just to reverse the trend of the previous decade. Thereafter, to maintain the gain in relative wages, about 1 million additional skilled persons need to be added to the workforce each year. Both these factors together (the one-off change phased in and the annual increase

to offset the trend against unskilled labour) would have required a total annual increase of skilled persons of 70-80% throughout the 1990s. This is a huge increase. It would require enormous and unaffordable increases in the subsidisation of tertiary educated workers.

Growing wage dispersion makes the focus on lifelong learning particularly relevant. Without counter measures being taken, there is a real possibility of growing polarisation: one group embraces the new technologies and survives and prospers in the "new economy" while another group (in which the elderly, ethnic minorities, and those from disadvantaged socio-economic backgrounds are likely to figure prominently) fails to keep up and is increasingly marginalised. It is highly likely that human capital investments can go some way to preventing such social exclusion. Hobcroft (2000) shows that, in the UK, educational qualifications show a clear and strong relationship to a wide range of indices of adult disadvantage (unemployment experience, being in receipt of welfare benefits, poor housing, early parenthood, etc.) at ages 23 and 33 for both men and women.⁵

3. The growth of service sector employment

The trend away from the production of goods to the production of services has been pervasive and well documented (see OECD, 2000b and references therein). On average, service sector employment now accounts for 65% of employment in OECD countries, approaching three quarters in several. Furthermore, services account for almost all net employment *growth*. However, the consequences of these trends are less easy to categorise, in large part because the service sector itself is so heterogeneous. While there is some convergence across countries in the overall service share, the same cannot be said for service sub-sector shares. Across, and even within, service sub-sectors the quality of jobs and their skill and education requirements vary considerably. Overall, it is true that service sector jobs are predominantly white collar (78% compared to under 30% in the goods producing sectors). As Table 2 shows, skill and educational levels are also considerably higher although there is substantial variability across and within the main sub-sectors of both services and goods production. The ratio of low-skilled workers is much higher in goods production than services, but is also high in personal services. The proportion of university educated workers is substantially higher in services, but this is mainly attributable to the producer services and social service sub-sectors; distributive and personal services have roughly the same proportion of university educated labour as does the goods-producing sector.

Rapid growth in producer services, in particular business services which use new technologies and have high proportions of skilled workers, suggests that if this sub-sector is to continue to be an engine of employment growth it will be essential to avoid skill bottlenecks, for ICT specialists in particular. Clearly, the

shift of employment towards services increases the premium on higher levels of formal education. The shift to services is not, overall, a shift towards "bad" jobs. Although the employment trends are not exogenous, and may themselves partly reflect growing levels of human capital, it is probably safe to assert that improved education and training will be necessary to minimise mismatch between the evolving job structure and the qualifications of the workforce.

Table 2. OECD averages of skill and educational characteristics, by sector, 1998

	Total goods-producing sector	Total service sector	Service sub-sectors			
			Producer services	Distributive services	Personal services	Social services
Ratio of low-skill to medium/high skill	1.25	0.45	0.24	0.67	1.00	0.26
Ratio of university to non-university workers	0.07	0.24	0.45	0.09	0.08	0.46

Notes: "Low skill" is ISCED 0-2 and medium/high skill is ISCED 3-7.

"University" is ISCED 6-7 and non-university ISCED 0-5.

Source: OECD (2000b).

4. Reorganisation of work within firms

Over the last decade or so, firms in most OECD countries have been engaged in a process of redesigning jobs and restructuring the delegation of responsibility; in short, there have been fundamental changes in the organisation of work. The reorganisation of work can be described in many ways, but the following components (which overlap to some extent) are central:

- A re-orientation from mass production to flexible working (flexible specialisation).
- Increased use of team work and job rotation.
- Job design involving multi-skilling and multi-tasking.⁶
- The decentralisation of decision-making with "flatter" or less hierarchical organisation.
- Greater employee-participation in decision-making.

These structural changes have their counterparts in the management science literature in the analysis of developments such as the replacement of "Tayloristic" with "holistic" organisation, the adoption of "lean production" or "just-in-time production" methods, and the philosophy of total quality management (TQM).

Reorganisation of work gives rise to many interesting questions, not least that of identifying the forces which have driven such changes.⁷ Understanding these forces is likely to suggest some implications for lifelong learning. Technical change is one of the main driving forces. By providing better information about what other workers in the firm are doing, by establishing communications networks and by providing up-to-date information on customer requirements, the rapid spread of new information and communication technologies has transformed many workplaces. Teamworking, multi-tasking and decentralisation of decision-making are all facilitated by these technologies, as is just-in-time manufacturing (via computerised inventory systems). Another purely technical determinant of new work practices is the spread of flexible and programmable tools and equipment. Not only do such features reduce traditional economies of scale by lowering set-up and retooling costs, but they require more versatile and technically proficient workers to operate the more versatile capital. That such new working practices require upgrading of existing skills and retraining may seem obvious. Some support is provided in OECD (1999a) which demonstrates a clear relation between the incidence and intensity of training and flexible work practices. To cite just one example, a US Bureau of Labor Statistics survey in the mid-1990s found that 98% of establishments using new work practices⁸ offered formal training opportunities for their workers while only 80% of establishments adopting none of these practices offered training. Furthermore, the intensity of training was greater in the firms adopting new work practices; workers spent four times as many hours in training as did workers in establishments not adopting these practices.

Skill requirements are changing in most jobs. Some examples are obvious: whereas workers in machine shops used to require dexterity and experience to work manually operated machine tools, today's programmed machine tools require their operators to be computer literate and probably have some programming skills as well. Similarly, the job of auto mechanic today requires skills to use computer-based diagnostic tools that are standard in most garages. Office workers today must be familiar with word-processing packages, accounting and billing software and advanced phone systems with conferencing facilities, voice mail, etc. But even in occupations where old technology has survived longer than expected, there are few workers who will not need supplementary skills to function effectively. For example, while in some (but not all) teaching environments the old "chalk and talk" technology has proved remarkably resilient, teachers still need to be computer-literate to access library materials, to keep effective records, to communicate with colleagues and to perform many other aspects of their jobs.

In OECD countries which forecast labour force growth by occupation it is generally found that the occupational groups requiring the most education (associate degree or higher) are the fastest growing. Even so, it will still be true in the foreseeable future that the majority of jobs will require less than degree

level education. However, the "basic skills" required in such jobs are changing rapidly; the US Department of Commerce (quoted in US Department of Labor, 1999) has estimated that by 2006, nearly half of all US workers will be employed in industries that produce or intensively use information technology products and services.

Of course the relationship between these technical changes and human capital is a complex one. Not only does new technology require new and more versatile skills, but the trend to ever greater stocks of human capital embodied in the workforce has enabled the successful application and adoption of these technical changes.

In summary, the current rapid rate of technical change has raised the skill requirements of most jobs. Not only has the demand for high tech jobs increased, but the rapid rate of change has placed a premium on flexibility. Most of the jobs created in the first wave of computerisation less than half a century ago no longer exist. Even where traditional skills are still in demand there are few workers who do not require supplementary skills to remain competitive in their current jobs. New approaches to the organisation of work place a premium on flexibility, adaptability, continuous learning, and the ability to transfer experience and skill development between activities. Clearly, this is a world of work that requires and rewards lifelong learning. The policy challenges are to devise strategies to provide workers with the education and training they need to keep their skills current and ensure they do not get stuck in low skilled and low paying jobs. Central to this strategy must be the creation of incentives to keep individuals learning throughout their working lives.

5. How serious are OECD skill and learning gaps in the face of these trends?

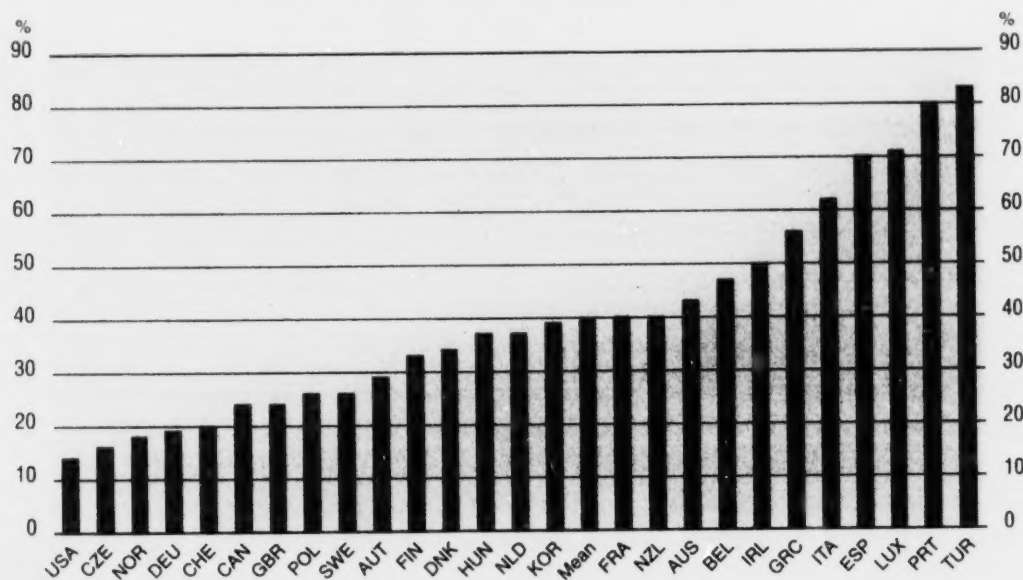
How well are OECD countries prepared to meet the challenges implied by the trends discussed above? We highlight three types of evidence that suggest even the more affluent countries have some weaknesses in the stock of skills and competences that are likely to be required to adapt to new trends that are transforming their economies.

a) *Lack of upper secondary schooling*

Firstly we look at the "working age" population (ages 25-64) and ask what proportion has *not* achieved at least upper secondary schooling. Figure 1 shows this for the whole working age population, while Figure 2 contrasts non-attainment of upper secondary schooling for the whole age group with that in the younger 25-34 age group.

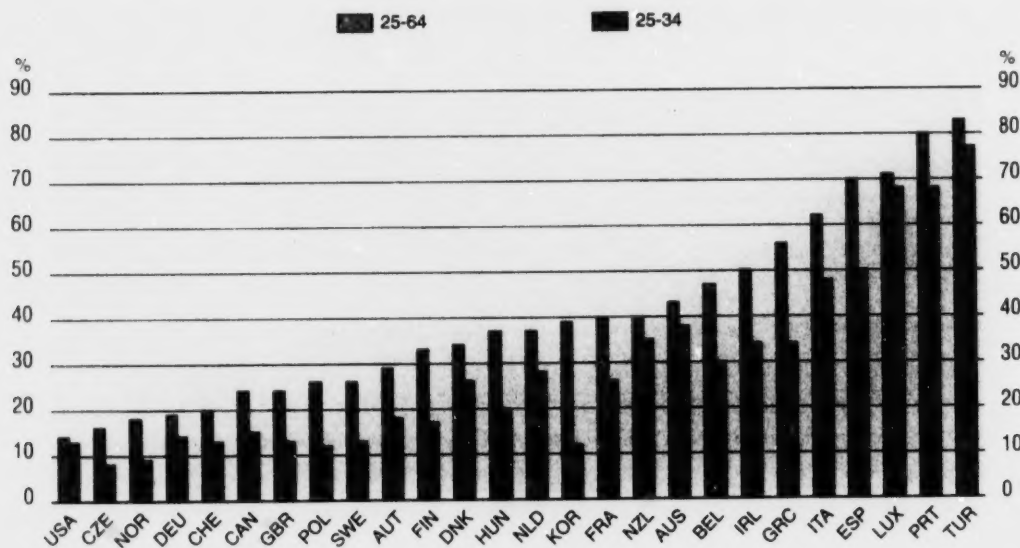
Given that upper secondary education has come to be regarded as virtually indispensable in order to achieve successful labour market outcomes, the figures suggest major shortfalls within the adult populations of many OECD countries.

Figure 1. Percentage of population aged 25-64 without upper secondary education, 1996



Source: OECD (1998).

Figure 2. Percentage of population without upper secondary education, by age, 1996



Source: OECD (1998).

On average 40% of the adult populations of OECD countries are without upper secondary schooling and some relatively affluent OECD countries have higher proportions than this (over 60% in Italy). The second figure shows higher participation for the younger age group; improvements are embodied in younger cohorts. Nevertheless, in half of the countries one quarter or more of the younger age group still is without upper secondary education. Even if we go to a lower age cohort, 20-24 year-olds, the participation rates are only marginally higher than the ones we have shown here for 25-34 year-olds.

6) Failings indicated by international achievement comparisons

Further evidence that our school systems may not be producing satisfactory results comes from international comparisons of student achievement. From as early as the first half of the 1960s such comparisons have shown a wide range of outcomes across OECD countries. Indicators of student performance in mathematics and science have been a particular focus, given the importance of these subjects in today's increasingly technological world. A recent headline-grabbing example came from Alan Greenspan, the US Federal Reserve chairman in testimony, to a congressional committee on education and welfare (*Financial Times*, 21.09.2000). "Substantial progress", he said, "would have to be made to improve primary and secondary education because it's just a matter of time before the bulk of the US economy involved work requiring higher-level, problem solving skills (...). Addressing this issue is crucial for our nation." He backed his arguments by citing data showing US students under-perform on international mathematics and science tests.

Table 3 shows the type of results that have been causing concern. For a fuller discussion of methodology, sources and results see OECD (1997), OECD (2000). See also Prais (1995) for an in-depth discussion of mathematics competence.

The range of achievement is substantial. Pupils in Korea and Japan achieve as highly in the 4th grade as Portuguese students do in the 8th grade. Nor is it the case that countries which rank low in the 4th grade results have the largest increase between the 4th and 8th grades; the second set of scores show Korea and Japan having *extended* their advantage over the other countries. The correlation between the two sets of results reflects, in part, the importance of success in early school years. In terms of ranking, some countries deteriorate between the two ages of testing; the US, for example, has above average results (just) at 4th grade but is well below average (better only than Portugal in our table) by the 8th grade.

As in the case of literacy, these results are likely to reflect a wide range of causal factors. Some of these may be amenable to policy manipulation (teaching methods, curricular emphasis accorded to particular subjects). Other influences are less easy to alter (socio-economic background, students' attitudes, etc.).

Table 3. Mean mathematics achievement of 4th and 8th grade pupils, 1995

	4th grade (age 10 approx.)	8th grade (age 14 approx.)	Difference
Korea	471	607	136
Japan	457	605	148
Netherlands	438	541	103
Hungary	410	537	127
Australia	408	530	122
US	407	500	93
Average ¹	398	524	126
Canada	395	527	132
England	376	506	130
Norway	365	503	138
New Zealand	362	508	146
Portugal	340	454	114

1. The mean achievement scores are averaged across a wider range of countries than those shown in the table: 17 countries for the 4th grade and 25 for the 8th grade.

Source: OECD (2000).

c) Low skills and skill gaps in the adult population

In providing an audit of human capital stocks and "educational effort" we have looked at enrolments and qualifications. An alternative indicator, which may highlight some priorities for lifelong learning policy, is to look at what actual skills people have (or lack). There are various ways of doing this. One approach is that followed in a series of studies by the National Institute of Economic and Social Research in the UK (see Prais, 1995). This methodology compares, across selected countries, productivity and workforce qualifications in matched samples of manufacturing plants and service suppliers as well as associated comparisons of training colleges and schools. This approach is useful in highlighting specific weaknesses in teaching and training relative to best practice. The general result of these studies was to emphasise the need to increase the proportions of the workforce with craft and vocational qualifications (rather than prioritise the proportion with university qualifications) and to focus effort on the appropriateness of qualifications and school curricula for those of average ability. Here we concentrate on a related but more general approach to highlighting shortcomings in specific skills and competence – the results of the International Adult Literacy Survey (OECD and Statistics Canada, 1997).

Literacy is broadly defined as "the ability to understand and employ printed information in daily activities at home, at work and in the community". Literacy, so defined, is a means to achieving individual goals and developing individual knowl-

edge and potential. The survey attempts to measure the distributions of three literacy domains:

- *Prose literacy.* The knowledge and skills needed to understand and use information from texts, including editorials, news stories, poems and fiction.
- *Document literacy.* The knowledge and skills required to locate and use information contained in various formats, including job applications, payroll forms, transportation schedules, maps, tables and graphics.
- *Quantitative literacy.* The knowledge and skills required to apply arithmetic operations, either alone or sequentially to numbers embedded in printed materials, such as balancing a cheque-book, figuring out a tip, completing an order form or determining the amount of interest on a loan from an advertisement.

The IALS testing and scaling method sets a number of tasks within each of these domains, and scales the responses in an interval of 0-500. Each scale was then grouped into five empirically determined literacy levels. We use the lowest two of these (levels 1 and 2) to represent the incidence of "low level skills" in the adult population. The reader is referred to OECD and Statistics Canada (1997) for full details of these literacy levels, but Table 4 gives descriptions of skills which define the lowest three skill categories and examples of skills which would *not* be generally within the competence of individuals categorised at the lower levels.

Bearing these interpretations of literacy levels in mind, we can look at the distribution of survey results for the OECD countries that participated in the literacy survey. This is done in Figures 3 to 5.

Given the rudimentary nature of the skills embodied in literacy levels 1 and 2, it is important to note that in all countries in the survey at least a quarter of their adult populations fail to progress beyond these basic skill levels (whichever domain of literacy is chosen). The UK has over 50% of its population at these two basic levels in each domain of literacy. The mean across countries is over 40% in each domain as can be seen in Table 5. Sweden is the only country with less than a tenth of its population in the lowest prose and documentary literacy level; for quantitative literacy Germany joins Sweden. The averages are close to one fifth of the population at the lowest level. Table 5 also shows substantial variation across countries.⁹ Many factors could be contributing to these inter-country differences. Both the age distribution and the distribution of education by age differ across countries and, given the association between education and literacy (see below), these differences, *ceteris paribus*, will generate different literacy outcomes.

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Table 4. Definitions and examples of literacy levels in the International Adult Literacy Survey

	Literacy domain		
	Prose	Document	Quantitative
Level 1	Reader required to locate one piece of information in the text, which is identical to or synonymous with the information given in the directive.	Reader required to locate a single piece of information based on a literal match. May be required to enter personal information onto a form.	Reader required to perform a single, relatively simple operation (usually addition) for which the numbers are clearly noted in the given document (or the numbers are provided).
Level 2	Reader required to locate one or more pieces of information in the text but several distractors may be present or low level inferences may be required.	Reader may be required to match a single feature but more distracting information may be present or the match may require low level inference. Again may have to enter information onto a form or cycle through information in a document.	Reader required to perform a single arithmetic operation (usually addition or subtraction) using numbers that are easily located in the text or document.
Level 3	Tasks at this level generally direct the reader to locate information that requires low level inferences or that meets specified conditions. Reader may also be asked to integrate or to compare and contrast information across paragraphs or sections of text.	Some tasks require reader to make literal or synonymous matches but usually reader must take conditional information into account or match on the basis of multiple features of information. May have to integrate information from one or more displays. May have to cycle through document to make multiple responses.	Reader required to perform a single operation. However, the operations more varied than at level 2 (multiplication and division included). Reader may be required to identify two or more numbers from various places in the document.
Example of a task a person at level 1 could NOT perform:	A level 2 task based on an article about the Impatiens plant asks the reader to identify "what the smooth leaf and stem suggest about the plant". The second para. of the article states "the smooth leaf surfaces and the stems indicate a great need of water". There was some distracting information about other aspects of the plant's appearance	Reader asked to complete the availability section of a job application form on basis of information provided about the total number of hours they are willing to work, the hours they are available, how they heard about the job and the availability of transport.	Reader is asked to use a weather chart in a newspaper to determine how many degrees warmer today's high temperature is expected to be in Bangkok than in Seoul. (Reader needs to cycle through table and then perform simple subtraction.

Table 4. Definitions and examples of literacy levels in the International Adult Literacy Survey (cont.)

	Literacy domain		
	Prose	Document	Quantitative
Example of a task a person at level 2 could NOT perform:	Given an article about cotton diapers the reader is asked to write down three reasons why the author prefers them to disposable diapers. Inference required as author never explicitly states "I prefer cotton diapers because..."	A Quick Copy requisition form (of a type that might be found in the workplace) is provided and the reader is asked to state whether or not the copy firm would make 300 copies of a document that is 300 pages long. The requisition form states that for documents over 100 pages the maximum number of copies is 200.	Two bar charts are given to the reader, one showing energy production for a group of countries the other showing energy consumption for the same countries. The reader is asked to calculate how much more energy Canada produces than it consumes.

Source: OECD and Statistics Canada (1997).

Of course, both the causes and consequences of low literacy levels are complex, and a detailed analysis is not possible here. In the context of lifelong learning, however, a number of issues arise. There is probably little debate that, in general, low literacy levels can be harmful to individuals' labour market success and quality of life. Indeed the IALS provides clear evidence that literacy is strongly associated with earnings, labour force participation, employment stability, lower unemployment and higher levels of adult education and training. In most cases these effects of literacy on economic outcomes survive in estimates which control for education and background variables such as gender and parental

Table 5. Means, standard deviations and coefficients of variation for percentage of population at literacy levels 1 and 2, participating countries,¹ 1994-95

	Prose			Document			Quantitative		
	Level 1	Level 2	1 and 2	Level 1	Level 2	1 and 2	Level 1	Level 2	1 and 2
Mean	19.03	29.44	48.47	19.17	27.42	46.59	17.66	25.95	43.62
Standard deviation	8.26	4.37	11.03	9.80	3.66	11.87	8.63	2.90	10.84
Coefficient of variation	0.43	0.15	0.23	0.51	0.13	0.25	0.49	0.11	0.25

¹ For participating countries, see Figures 3 to 5.

Source: OECD and Statistics Canada (1997).

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Figure 3. Percentage of adult population (16-65) at prose literacy levels 1 and 2, 1994-95

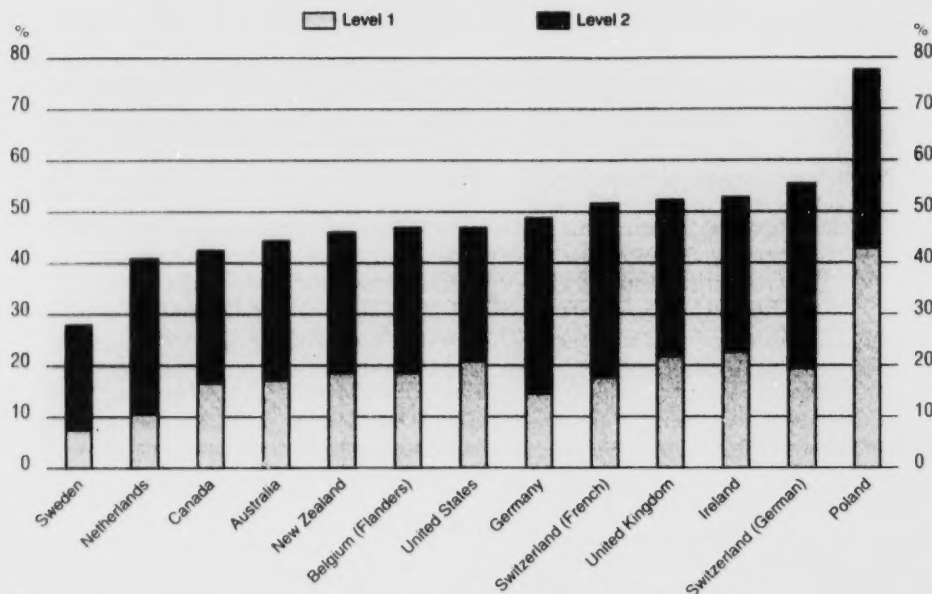
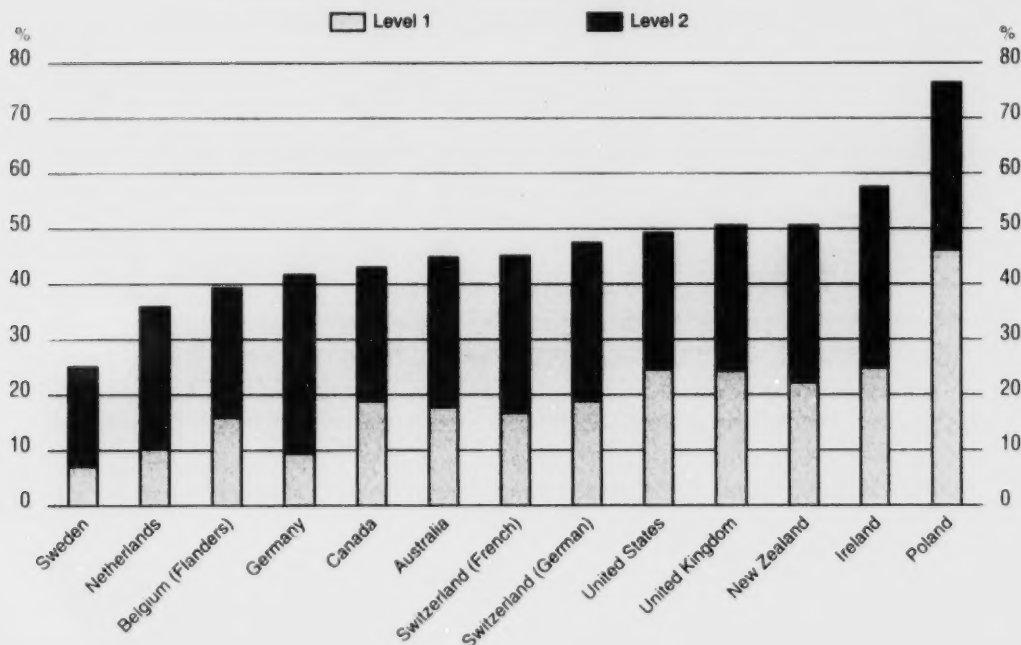
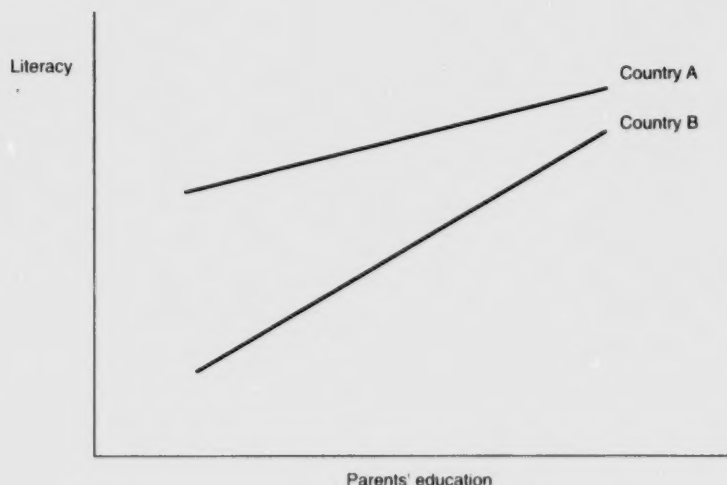


Figure 4. Percentage of adult population (16-65) at document literacy levels 1 and 2, 1994-95



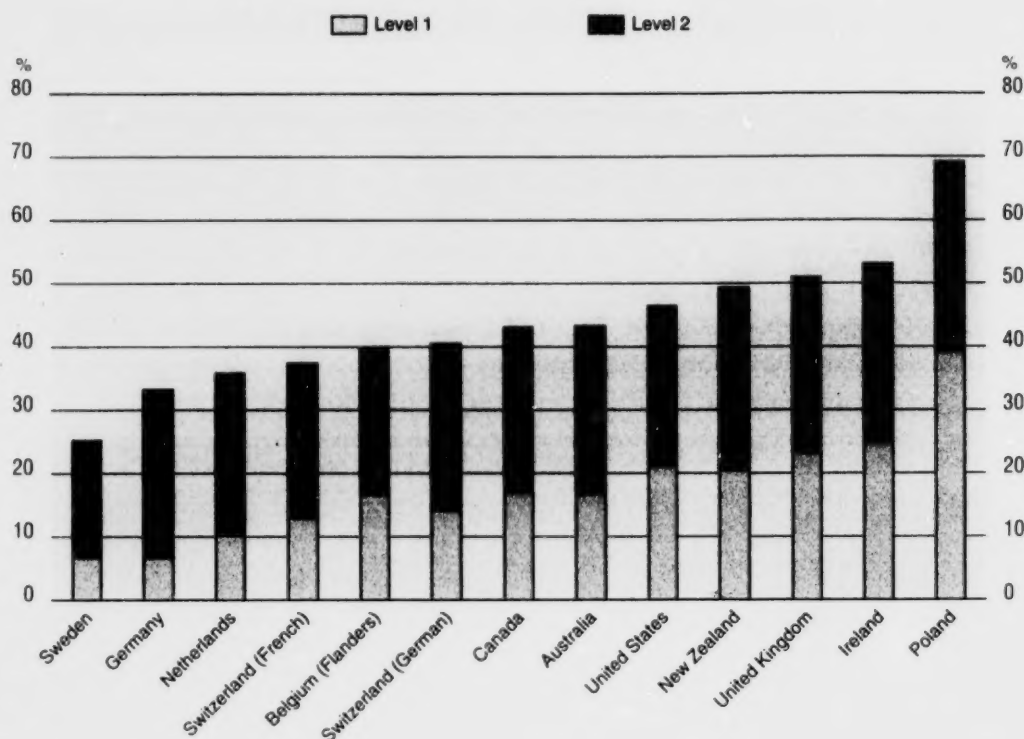
Source: OECD and Statistics Canada (1997).

education and occupation. At a broader level it is hard to believe that major skill gaps as evidenced by poor literacy is not a barrier to economic progress and social cohesion. A possible indicator of the latter is provided by IALS results, which suggest, within countries, a positive association between literacy and community participation (as measured by participation in voluntary community activities at least once a month during the year preceding the interview). Looking across countries there appears also to be some association between literacy and community participation.¹⁰ Of course it would be simplistic to suggest that literacy levels are the only or main determinant of community participation; nevertheless the association is suggestive. A positive association between literacy and social cohesion is further suggested by "gradient analysis". In the present context this relates to the relationship between socio-economic background and literacy; gradients are the (standardised) coefficients estimated by regressing literacy on socio-economic indicators such as parental education (itself a proxy for family income and socio-economic status). A stylised picture of the results is shown in the diagram below.



The gradients of the lines are indicators of inequality of literacy outcomes across socio-economic groups (as represented here by parental education). Suppose the lines in the diagram represent young people (say 16-25). Then, in Country B schools and institutions of higher learning are less able to transform the differences that students bring with them; patterns of skills and socio-economic status tend to be reproduced. In Country A the gradient is shallower, indicating that parental education has a smaller impact on literacy outcomes; schools ameliorate

Figure 5. Percentage of adult population (16-65) at quantitative literacy levels 1 and 2, 1994-95



Source: OECD and Statistics Canada (1997).

differences and socio-economic patterns are less likely to be reproduced. The finding of note in the IALS is that countries with high levels of overall literacy tend to have shallower gradients than countries with lower levels of average literacy. Thus, in Sweden (an example of an A-type country), youth whose parents had completed only 8th grade scored, on average, 13% of a standard deviation above the international average document literacy level. In the US (a B-type country), such youths scored 60% of a standard deviation below the international mean. Note also that people from advantaged backgrounds (high parental education) tend to do well in each country. What differentiates countries is the literacy attainment of people from disadvantaged backgrounds.

One question is whether the skill gaps shown in the tables are simply a reflection of each country's enrolment ratios at different levels of education. If this were the case, say if completion of upper secondary school was a virtual guarantee of high literacy, the policy message would be clear enough – skill gaps could be eliminated

if there were virtually universal completion of upper secondary schooling. This, however, is not the case. Of course there is a broad correlation between formal education and literacy, but there is sufficient variability to suggest enrolment is not a good instrument, on its own, to eliminate skill gaps. In every country in the study there is a wide range of literacy scores *at each level of education*. Table 6 illustrates this; it shows substantial cross-country variation in mean literacy scores by highest level of formal education. The table refers to document literacy, but the results for prose and quantitative literacy are similar. The table shows that while individuals who have not completed upper secondary have, on average, a literacy score which places them about one third into the level 2 range, there is considerable variation across countries. In both Poland and the US (no doubt for different reasons) individuals who have not completed upper secondary will not, on average, attain literacy level 2. On the other hand in Sweden individuals without upper secondary are well into the level 3 range. Thus, those with low levels of education in Poland and the US are at more of a disadvantage than are those with low levels of education in Germany and Sweden. Completing upper secondary will, on average, generate a literacy score that locates them just less than one fifth into the level 2 range. Again, Poland and the US are the exceptions. Completing upper secondary in

Table 6. Document literacy by education

	With less than upper secondary		Completed upper secondary
	Mean document score (literacy level)	Percentage who score at level 3 or above	Mean document score (literacy level)
Australia	248.5 (2)	37.6	281.9 (3)
Belgium (Flanders)	250.9 (2)	40.2	288.6 (3)
Canada	227.1 (2)	27.3	288.0 (3)
Germany	276.1 (2)	50.6	295.4 (3)
Ireland	231.5 (2)	23.0	280.5 (3)
Netherlands	262.6 (2)	42.3	302.3 (3)
New Zealand	244.5 (2)	30.3	287.3 (3)
Poland	201.5 (1)	14.0	251.5 (2)
Sweden	280.6 (3)	59.3	308.3 (3)
Switzerland (French)	235.0 (2)	20.6	283.4 (3)
Switzerland (German)	230.6 (2)	24.6	283.2 (3)
United Kingdom	247.4 (2)	36.7	285.5 (3)
United States	199.9 (1)	17.1	266.1 (2)

Note: Skill levels ranges are:

- Level 1: 0-225
- Level 2: 226-275
- Level 3: 276-325
- Level 4: 326-375
- Level 5: 376-500.

Source: OECD and Statistics Canada (1997), Tables 1.1 and 1.5

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these countries is, on average, not associated with the literacy skills required to achieve level 3.

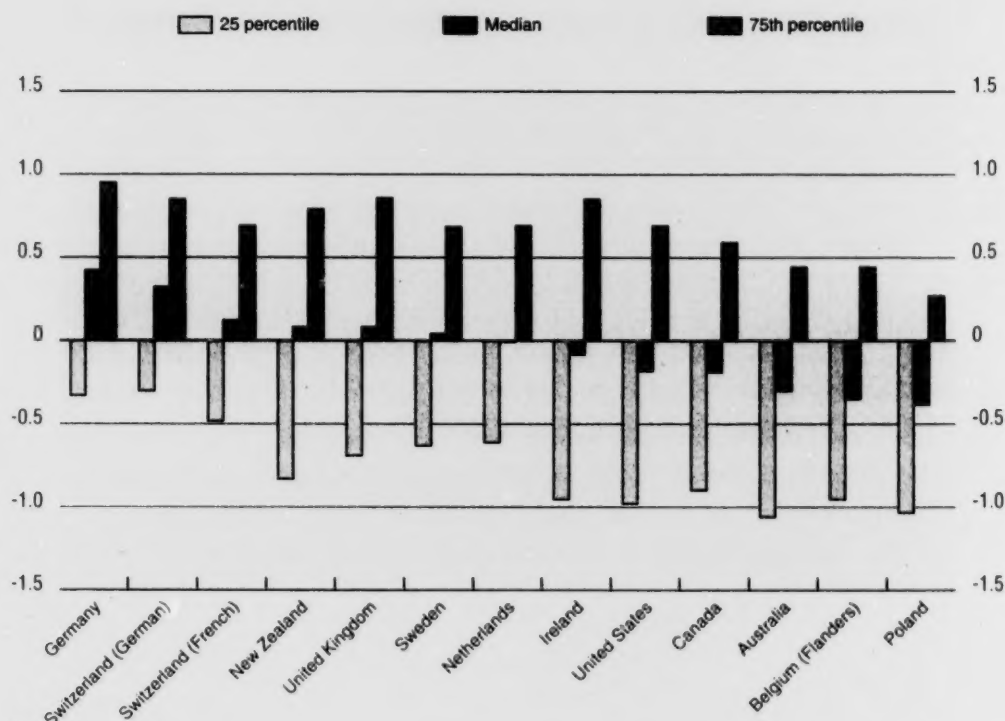
Conversely, the middle column of figures shows that in each country a sizeable proportion (roughly a third, on average) of individuals who have not completed upper secondary still manage to score high enough on the document literacy test to place them at levels 3, 4 or 5.

On the face of it the fact that on average those completing compulsory schooling only achieve literacy scores placing them in the lower part of the level 2 range does suggest some deficiencies in the schooling regime, although of course non-school factors also contribute. Nevertheless, appropriate responses to poor literacy outcomes would include policies aimed at encouraging students to complete upper secondary schooling, along with curricula reforms aimed at ensuring minimum literacy standards. We expand on this suggestion below.

However, some remedial responses lie elsewhere than with pre-school and formal education, important as these periods are. Consider the effects of age. In most countries, literacy falls from the ages of 40-45. This is partly due to cohort effects – older generations have lower educational attainment and it is possible that their education was also less geared to literacy outcomes. Nevertheless, one result of the IALS is that, *even having standardised for education*, literacy declines with age. This suggests that literacy skills can depreciate over time if not maintained by appropriate practice at home and at work. If skills can decline with age it is not unreasonable to expect that they can be improved by good literacy practices at home and in the workplace. IALS confirms that there is considerable variation across countries, education levels and industries in the extent of literacy engagement at work. Figure 6 shows that even for individuals with a given level of formal education there is considerable variation, both across and within countries, in the extent of literacy practice at work (Box 1).

The rankings we see in this figure are fairly robust, with Germany having high relative levels of literacy engagement at work at all levels of educational attainment. In other countries, such as Sweden and the US, the relationship with formal education is stronger than in Germany; so for persons with tertiary education in these countries the level of literacy engagement at work is roughly the same as for Germany. Literacy engagement at work also varies across industrial sectors, being, on average, particularly high in financial services and low in agriculture. Again there is considerable variability within each sector. Patterns are not uniform across countries. In German manufacturing the median score on the index (relative to the international mean of zero) is 0.3, while in the US it is -0.22. Looking at the differences both within and between countries and sectors the IALS report concludes "Given the role which level of engagement in literacy at work is thought to play in the maintenance and growth of literacy skill in adulthood, the existence of these

Figure 6. Distribution of index scores for engagement in literacy activities at work for individuals with upper secondary education, 1994-95



Source: OECD and Statistics Canada (1997).

Box 1. The IALS literacy engagement at work index

IALS respondents aged 16-65 who were working full time were asked a series of questions pertaining to the frequency with which they engaged in specific literacy tasks at work. These included reading magazines or journals, manuals or reference books, diagrams or schematics, reports or articles, reading or writing letters or memos; bills, invoices or budgets; writing reports or articles; estimates or technical specifications; calculating prices, costs or budgets. For each task a scale was constructed to indicate the number of times per week the respondent engaged in the task. The scores were then averaged within each category to provide an "engagement index". For Figure 6 the scores were standardised to have a mean of zero and a standard deviation of 1 at the international level.

differences is cause for concern". One can certainly conclude that there is a role for employers, as well as for the formal education system, in developing literacy skills and preventing them from depreciating. The precise details of employer action will need to be researched carefully and tailored to existing literacy levels in each country. However, a comprehensive programme would certainly place a responsibility on employers not only to provide or encourage remedial action for workers with low literacy levels but also take responsibility for ensuring that workers make best use of the literacy skills they do possess.

The IALS provides the most detailed and systematic documentation of skill gaps, but there is widespread corroboration from individual countries. For example, a 1996 American Management Association (AMA) survey of mid and large scale firms found that 19% of job applicants taking employer-administered tests lacked the mathematics and reading skills necessary in the jobs for which they were applying. By 1998 the AMA survey found that this percentage had increased to almost 36% (US Department of Labor, 1999).

The implications of these literacy findings for lifelong learning are profound. We have emphasised how changing technologies and the changing nature of work require continuous upgrading of basic skills and enhanced adaptability. Functionally illiterate workers are highly unlikely to meet these requirements. We are not aware of systematic research showing the payoff for improving literacy, but the large earnings and employment differentials by literacy level documented in the IALS suggest that such investments are likely to be highly profitable, both for individuals and society.

How to tackle the startling shortcomings revealed by the IALS and other surveys is, of course, a complex question. Different approaches are likely to be appropriate in different countries. Are there any general principles? We tentatively suggest the following:

- *Early testing to detect young people at risk.* We now have quite good knowledge about adult illiteracy, but a forward-looking programme requires early detection so that the problem can be treated before it precipitates a self-reinforcing pattern of low educational, social and economic attainment.
- *Prevention is better than cure.* This suggests that top priority should be given to raising standards in primary schools. Pupils who leave primary school with inadequate literacy and numeracy will not cope with secondary school curricula nor with the needs of "good" jobs when they enter the labour market. They are likely, on balance, to have poor educational attainment, higher unemployment and lower earnings than their more literate and numerate peers. Reducing illiteracy by the end of primary schooling is partly about raising standards in general. This, in turn, relates to a whole raft of issues from teachers' pay to institutional and management structures.

- *Targeted programmes.* Over and above improving standards across the board, targeted remedial strategies are probably in order. Thus the UK has introduced National Literacy and Numeracy Strategies with specific targets and instruments for dealing with the problem. One aspect which has received considerable attention is the daily Literacy Hour in primary schools. These are structured lessons intended both to reinforce the importance accorded to literacy and to reflect the objectives of the national strategy. The Literacy Hour has a common structure so as to ensure continuity when children change classes or schools. Preliminary results of the National Strategy in primary schools are encouraging.
- *For adults, motivation is crucial.* Illiterate and innumerate adults are often poorly motivated to seek remedial help. National publicity can help to reduce social stigma, information can underline the net benefits in terms of employment, earnings and fuller participation in society and subsidies can improve the private benefit of remedial programmes.
- *Reducing illiteracy will require a range of partners.* Most governments see it as their responsibility to be centrally involved in literacy and numeracy enhancement. Indeed, insofar as the prevention lies in primary and secondary school teaching, the state, *de facto*, has a major responsibility. This probably extends to adult illiteracy as well. Subsidisation of adults on basic skills programmes in further education colleges has been widely agreed to be desirable in the wake of literacy findings, as has utilisation of new technologies to aid in self-diagnosis and subsequent guidance. Unemployment programmes increasingly include literacy screening and skills testing followed by guidance on appropriate courses of action. Like other aspects of lifelong learning, however, partnerships are likely to be more effective than purely state-run and financed initiatives. Employers, trades unions, community organisations, and of course individual families, all have roles to play. Examples range from literacy and skills classes sponsored and hosted by local football clubs to language and culture classes organised by and on behalf of ethnic minorities.

6. Access to information and communication technologies

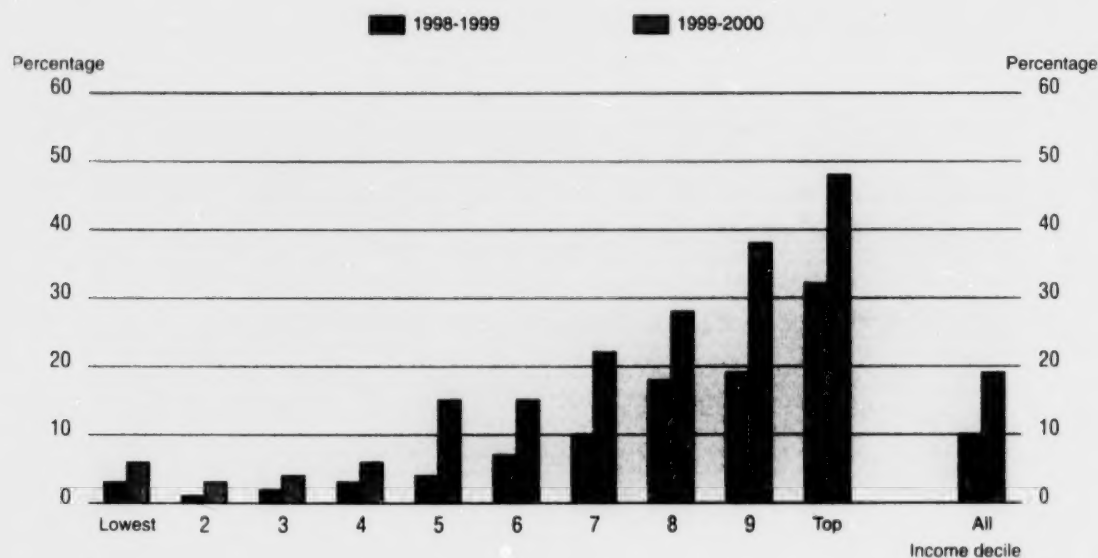
As the rapid development of information and communication technologies transforms many aspects of life, concern has grown that unequal access to such technologies could lead to a new form of social exclusion. Groups excluded from the Internet will be deprived of access to a whole range of potential benefits, only now becoming apparent. These include access to education, training, financial and health services provided online, the advantages of Internet shopping, cheap communication, entertainment and other leisure services. The possibility of significant

proportions of the population being excluded from the benefits of the new technology has led some social commentators to talk of a *digital divide*, with those without access becoming increasingly marginalised.

The current pattern of Internet usage does give some support to the fears of a digital divide. Figure 7 shows a clear correlation between home Internet access and income in the UK.¹¹ Furthermore, access is growing fastest in the middle of the income distribution (5th to 7th deciles) rather than for the poorest households. Similar, if less pronounced, patterns have been documented in the US. Certain household types also have low usage; in particular one-parent households and retired households (households with two adults and one or more children have the highest levels of Internet access). With many of the lifelong learning initiatives we describe later in the paper dependent in one way or another on familiarity with and access to new ICT, these patterns give cause for some concern.

It is possible that these concerns are premature. The Internet is still a relatively new technology and the normal diffusion pattern is by no means complete; over time one would expect greater usage by income and demographic groups which currently have little or no usage. Furthermore, to the extent that cost is a barrier (the price of PCs is often cited as a deterrent by low income groups),

Figure 7. Households with home access to the Internet by income decile group, United Kingdom, 1998-99 and 1999-2000



emerging technologies which will provide access via digital TV and mobile phones may be expected to relax the financial constraint. The spread of cyber-cafes and free or cheap Internet access in public libraries should have the same effect.

Nevertheless, it should be part of a comprehensive lifelong learning strategy to monitor access to new technologies and to address constraints which could exclude disadvantaged groups from gaining access to lifelong learning initiatives dependent on such technologies.

Notes

1. One development not discussed is the alleged growth in job insecurity and instability. This is partly because many researchers have, in fact, been unable to find hard statistical evidence of such a trend (although perceptions may be important, regardless of the reality). Another reason for not resting a case for augmented lifelong learning on declining job stability is that the phenomenon, to the extent that it exists, is in part cyclical rather than a long-term trend. There is some evidence (Mishel *et al.*, 2001) that the sustained recovery in the US during the 1990s reduced temporary and part-time working and increased longer-tenured jobs. For further evidence on job insecurity see OECD (1997a), Neumark *et al.* (1997), Hipple (1999), Nardone *et al.* (1997) and Nickell (1999).
2. This phenomenon is best documented for the US and UK but there is also evidence (see Gottschalk and Smeeding, 1997) that it is more widespread within the OECD.
3. In the US the employment prospects of the poorly qualified were already poor by the beginning of the 1980s so the small increase in inequality thereafter does not indicate how badly off this group was. Furthermore, during the 1980s their relative earnings fell even though employment rates were relatively stable.
4. See, for example, Berman *et al.* (1998). Nickell and Bell (1995) argue against the demand shift hypothesis, claiming it explains only a modest proportion of the increase in European unemployment. One aspect of their argument is particularly relevant in the life-long learning context. They note that in the 1980s and first half of the 1990s German men in the bottom of the wage decile earn more than twice as much as American men in a similar position and yet have similar unemployment rates. How can they earn so much and keep their jobs? The answer according to Nickell and Bell is that Germans at the lower end of the ability and education distribution are in fact much better educated than American men (they cite international test scores and literacy levels as evidence). In other words the German system produces a much more compressed distribution of human capital than Britain or the US, enabling the less qualified workers to be employed at higher wages. The superior quality of German vocational education is likely to be a contributing factor.
5. This relation between education and social exclusion is observable even after controlling for a wide range of childhood factors.
6. One consequence of which is that traditional occupational definitions and occupational barriers are breaking down.
7. A somewhat more subtle and technical question is where the rise of multi-tasking leaves the traditional arguments in favour of specialisation. Why have falling costs of communication and co-ordination among workers not resulted in more specialisation? For a theoretical discussion of these issues see Lindbeck and Snower (2000).

8. At least one of the following: worker teams, total quality management, quality circles, peer review of employee performance, worker involvement in purchase decisions, job rotation, just-in-time inventories.
9. The IALS report also documents large variability of literacy scores *within* countries. For many countries the distribution of scores is positively skewed, so that even where the average is relatively high there are many in the population with quite low scores.
10. Sweden, which performs best on literacy scores, has the highest community participation. Poland, which has the lowest literacy scores, also has the lowest extent of community participation.
11. The reason that the lowest income decile actually has slightly higher access than the second decile is probably accounted for by the presence of student households in the former.

Resource Allocation and Financing Framework: Who Should Pay for Lifelong Learning?

1. Introduction

A serious commitment to lifelong learning will involve doing some new things and doing some old things better. Where are the resources going to come from? One of the themes of this paper is that implementing the lifelong learning vision cannot be the responsibility of governments alone. While governments will continue to make direct contributions to provision and support throughout the education and training spectrum, government resources are finite and some of these will best be used to leverage resources from interested non-government parties. It will act as an enabler and a pump-primer. Both provision and financing will depend on contributions from coalitions of government agencies and a range of social partners.

Public sector resources can come, in principle from one of three sources:

- *"New" resources.* Net increases in the level of real resources devoted to lifelong learning. Where real per capita income is growing, given tax rates and given ratios of spending on education and training to GDP generate real increases in spending. In other words, with unchanged tax and spending rates the so-called "growth dividend" generates net new resources, some of which can be devoted to lifelong learning. Abstracting from growth, financing net increases in lifelong learning spending requires increased taxation or increased borrowing – mechanisms that many governments today are constrained to use sparingly.
- *Reallocation of existing resources between spending categories.* Where the case for expenditure on lifelong learning, or particular components of lifelong learning, can be shown to be sufficiently compelling (because they have high expected social rates of return), it may be justifiable to finance them by transferring resources from other government spending categories.
- *By using existing resources more efficiently.* Economists sometimes refer to this as "X-efficiency" rather than allocational efficiency.

There is surely scope for utilising each of these routes. The mix will vary from country to country, and subsequent sections will attempt to provide some specific examples where each is feasible. The magnitude of the challenge should not be underestimated however. Even the relatively painless route of holding constant tax and spending proportions and allowing growth to generate real spending increases is not an easy one to follow. The 2001 edition of *OECD Education at a Glance* notes that only in a few countries¹ did public expenditure on educational institutions keep up with overall economic growth during the latter half of the 1990s. Furthermore, in the majority of countries increases in educational expenditure have not matched rising numbers of post-high school students; per student expenditure have fallen.

In terms of mobilising private resources, similar general principles apply. Firms, financial institutions and individuals will need to consider whether it is appropriate to devote a larger share of their budgets to lifelong learning expenditure, whether they should substitute lifelong learning expenditure for some of the things they currently do, and whether they could release some funds by doing these existing tasks more efficiently. As stated above, they may be induced to do each of these things by government actions, subsidies, changes in taxation and regulation, etc.

2. Volume and expenditure targets for lifelong learning

To state the obvious, the analysis of funding lifelong learning becomes much clearer if it is known exactly what has to be financed. Unfortunately, generalisation is difficult. Priorities will differ from country to country. Even in a given country there may be many lifelong learning initiatives that governments would like to undertake but no unambiguous menu of what "needs" to be done. Some work conducted in the OECD has attempted to establish minimum benchmarks.² This analysis attempts to establish broad orders of magnitude for individual countries about how ambitious their lifelong learning objectives could be and about the extent to which these could be financed from existing resources, rather than having to rely on new sources to mobilise substantial additional resources. This approach is based on estimates of "participation gaps" and "expenditure gaps" that countries would need to close to realise specified lifelong learning scenarios. In essence, the approach has three stages. Firstly, sets of targets for participation in various stages of lifelong learning are formulated for each country. These are framed on OECD median or "good practice" participation rates (the latter typically being defined as "fourth best" in the OECD country rankings). Secondly, these targets are compared with current provision to calculate participation gaps. Thirdly, existing cost data are used to estimate the costs of closing these gaps.

The approach has a number of fairly obvious conceptual and practical difficulties. One of these is that the targets to be fulfilled must be arbitrary, to some extent at least; there is no unambiguous objective in any particular branch of lifelong

learning, although for the compulsory schooling there is probably a political consensus that 100% participation is desirable. Where gaps exist, applying historical unit costs may not be a reliable method estimating the expenditure required to close them. This is because *ex post* average costs and *ex ante* marginal costs (the relevant concept) may differ substantially due to economies of scale and other factors (are marginal students more difficult to teach than existing ones?).

For adult education and retraining, setting targets is a very imprecise exercise; appropriate participation will depend on demographics, sectoral employment distribution, the state of the economy, the extent to which firms supply training, and many other factors. Furthermore, even where participation targets can be set, estimating the costs of achieving these is likely to be particularly difficult because of the diverse modes of provision for adults. These vary from government training programmes for the unemployed to informal on-the-job training. Attaching costs to deficit reduction is further complicated by the existence of different cost sharing arrangements in this sector. Reliable estimates of historic unit costs are not generally available, let alone marginal cost estimates. In the event, for adults the approach constructs two indices for the size of the task confronting countries with respect to adult lifelong learning policy. The first of these expresses the deficit in adult lifelong learning in terms of the proportion of adults (ages 25-64) with less than upper secondary education and the proportion with adult literacy below level 3 (see Chapter 2 above). The second approach uses information on lifetime training expectancy (measured in hours) to establish good practice benchmarks. Many of these difficulties in establishing what needs to be done in adult lifelong learning also apply to ECEC where there is little consensus about what constitutes optimal provision and where costing is complicated by heterogeneous modes of provision.

The usefulness of the general approach discussed above is not so much in providing precise costings of different scenarios, but rather in establishing broad orders of magnitude of the scale of the task facing different countries. These are best thought of as reference points or benchmarks; except for the poorest countries with the largest shortfalls in current provision³ they may be regarded as minimum programmes to achieve acceptable lifelong learning provision. The implied programmes emerging from this exercise contribute to an ongoing policy formulation process. If the implied costings of a given lifelong learning scenario with its implied targets turns out to place prohibitively demands on the public purse, policy-makers will need to scale down their objectives, consider methods for achieving them at lower costs to the public sector, or a combination of the two.

3. Arguments for government intervention in lifelong learning provision

A theme of this paper is that the funding of lifelong learning cannot rest with governments alone. Nevertheless, it is worth considering whether any principles

can be established which will spell out certain types of funding where governments need to be involved if certain objectives are to be achieved. In practice, governments intervene in the financing, supply and regulation of education for a number of reasons, including the seeking of political advantage. In purely economic terms there is a case for such intervention when the amount of a given type of lifelong learning resulting from private choices differs from the socially optimal amount. Why might these two amounts differ? The socially optimal amount is determined by equating the rate of return on the investment⁴ with the return on the best alternative that has to be foregone by undertaking the investment. Similarly, the privately optimal amount of lifelong learning is determined where the private rate of return to the lifelong learning investment is equal to the private discount rate. The reason these two amounts can differ boils down to "market failure", appropriately defined. Traditionally, market failure is defined in terms of efficiency alone, in which case equity considerations constitute additional grounds for government action. If poverty and unequal earnings are themselves defined as being market failures, then all government intervention can be thought of as being directed at the correction of such failures. In the following two sections we consider in broad terms some of the main efficiency and equity arguments for government intervention in the supply and/or financing of lifelong learning. Some of these arguments are fleshed out in Chapter 4 in relation to specific sectors.

a) *Efficiency arguments for government intervention in lifelong learning*

When considering possible market failures which could justify government intervention, we usually think of the market for the particular type of human capital on which the analysis focuses; the market for ECEC, for tertiary education, for training, etc. However, imperfections in related markets, capital and labour markets in particular, spill over in to these markets. In the human capital market the demand price can be thought of as the present value of the earnings gain the investment generates, while the supply is the marginal cost to individuals or firms of increasing human capital by some given amount. In the absence of either capital or labour market imperfections investors will augment their human capital up to the point where the price they pay (directly or in terms of foregone earnings) is equal to the present value of the earnings gain associated with the training. Thus, the marginal cost of the investment is equal to the present value of its marginal benefits. This is a first best optimum – where markets work perfectly private and social optima do not diverge. In the real world a variety of market failures prevent the attainment of this happy outcome. What follows is a more or less standard list of such failures⁵ that may provide a rationale for government intervention. Subsequently, we will consider in more detail how these relate to particular phases of the life cycle. The point here is that different types of market failure are relevant to different types of

education, learning and training; hence the rationale for intervention will differ for different components of lifelong learning.

In considering the following arguments that are often used to justify government intervention, it is important to use the appropriate base-line or starting point. Take the case of educational externalities. The existence of an externality does not, in itself, justify intervention. One has to ask *whether the externality is relevant at the particular margin under consideration*. Thus, while it is no doubt true that there are substantial externalities in having a literate society, these externalities are no longer marginally relevant in most OECD countries where primary and lower secondary education are near-universal (notwithstanding the evidence presented in Chapter 2 showing substantial pockets of adult illiteracy). While such externalities could justify government supply or subsidisation in countries with low enrolment rates in primary education, they are not, in general, relevant to OECD countries. Similar considerations apply to other arguments justifying government intervention; one must always ask whether the arguments apply given the actual starting point. The relevant policy question is very often not "is government intervention justified" but "is *further* government intervention justified, given existing conditions".

Capital market imperfections

If it were the case that the rates at which individuals could borrow to finance a given component of lifelong learning were substantially greater than the social discount rate, then, *ceteris paribus*, individuals left to themselves would under-invest in training. The social discount rate is conveniently thought of as some weighted average of the shadow price of consumption (often in turn approximated by the yield on government bonds) and the borrowing rate faced by corporate borrowers. The borrowing rate faced by individuals wishing to finance lifelong learning is likely to exceed both components of the social discount rate, suggesting the required return to such lifelong learning investments is in turn greater than the social discount rate. High discount rates increase the costs of income smoothing, and some combinations of costs and benefits that would induce investment with perfect capital markets are now rejected. The amount of investments is therefore less than its socially desirable level.

Why is it that individuals who wish to finance human capital investments face high borrowing rates? The classic answer is that, unlike other forms of capital, human capital cannot act as collateral for loans. Except in the irrelevant case of slavery, there is no equivalent to the possibility of securing the loan by repossessing the capital in the case of default, the means by which loans are secured in other markets, the housing market being a prime example. In the case of formal education and early job market training it is difficult for trainees to finance training, directly or indirectly (by accepting low wages), from personal savings, because

these investments are made relatively early in the life cycle when personal savings are likely to be low or non-existent.

Borrowing constraints are likely to have a differing impact depending on family income and socio-economic background, introducing equity as well as efficiency considerations. This point is often made with regard to tertiary education, but really the argument applies to many of the lifelong learning investments at different stages in the life cycle. The basic argument is that children from more affluent backgrounds have access to funds that are not available to children from poorer families, making costs of funds higher for these children and as a consequence limiting their access to tertiary education. While it is true that children in more affluent families are dependent on the goodwill of their parents to access such funds, it is true in general that to some degree there is a consumption element in parental spending on children's education. Although there are exceptions, it is generally true that families with higher incomes buy more and better quality education for their children.

There are instances where the effects of borrowing constraints have been overstated. In the US, for example, although that country has high participation in tertiary education by international standards, it is still true that the children of disadvantaged groups are underrepresented. Is this because they face borrowing constraints? In part perhaps, but the existence of generous scholarships and cheap loans for disadvantaged students suggests that one must look elsewhere for the explanation of low participation of certain groups in tertiary education.

Nevertheless, there can be little doubt that borrowing constraints do affect individuals' willingness and ability to make lifelong learning investments. Two specific financing mechanisms we advocate in subsequent sections – income-contingent loans in tertiary education and individual learning accounts to finance investments for individuals in the labour market – can be thought of as specific attempts of governments to counteract the borrowing difficulties faced by individuals wishing to invest in learning.

Risk and uncertainty⁶

The argument in the preceding paragraphs abstracts from risk. Of course, in an objective sense, the returns to lifelong learning investment are uncertain. This uncertainty has at least two major components. Firstly, the demand for skills fluctuates; arguably, the demand is particularly volatile today as many economies are in a state of major sectoral employment reallocation due to the ICT "revolution". Secondly, individuals are uncertain of their abilities to master and profit from their lifelong learning investments. Under such circumstances the utility of expected returns is reduced by risk. As with capital constraints, the amount of lifelong learning demanded by individuals is less than it would be in the absence of such uncertainty.

It is not obvious that such risks are greater for lifelong learning investments than for non-human capital investments. However, even if they are not, individuals are likely to be more risk averse than firms or governments, the former protected by limited liability,⁷ the latter able to spread risk more effectively than either individuals or firms. If governments believe that lifelong learning is inhibited by excessive risk-aversion on the part of potential investors, this can be offset either by straight subsidies (the government will get some return in terms of higher tax revenues from augmented average earnings) or by income-contingent loans. The latter effectively reduce or eliminate risk to the investor, depending on the details of the loan scheme.

A related source of under-investment arises where individuals underestimate the returns to making lifelong learning investments or, equivalently, the labour market risks of not training or retraining in a world of rapidly changing labour demand. Again in such circumstances they will under-invest. There is little evidence of any systematic misperceptions of the returns to lifelong learning investments. However, it is not implausible that individuals fail to appreciate the effects of technical change, globalisation and other factors that generate income and employment risks to them.

Other information issues

Informational asymmetries often exist between demanders of particular types of lifelong learning and suppliers. Our analysis so far has recognised that even for a given quantity and quality of lifelong learning investment the benefits are uncertain because of fluctuations in future labour demand and/or in individuals' own knowledge of their abilities. Informational asymmetries, by contrast, are structurally related to the complexity of the service being provided or the intrinsic difficulties of monitoring quality. For example, firms and other training providers know more, *ex ante*, than trainees about the amounts and quality of training that will be received on the job, the suppliers of ECEC know more than parents about the content and quality of services provided (and monitoring is difficult or expensive). Such lack of knowledge is likely to act as a disincentive for individuals to pay for investments directly or by accepting lower wages while investing. Government regulation of lifelong learning suppliers' standards may be called for in such circumstances (Malcolmson *et al.*, 1997).

Asymmetrical information can interact with capital and labour market imperfections to influence outcomes. Take the case of training. Suppose, not unreasonably, that the firm that supplies the training has more accurate knowledge than other firms of the trained worker's productivity. This provides the training firm with some monopsony power and enables it to pay less than the value of marginal product without necessarily losing the trained worker. By reducing the demand for

training more than supply⁸ increases, this can generate sub-optimal training, but where workers are credit constrained it can lead to an overall increase in training. The intuition here is that capital market constraints have reduced training to some minimal level so that reductions in expected returns have little additional impact. On the other hand supply increases, so the net effect is positive.

Taxation

While taxes reduce both the opportunity cost and the returns for lifelong learning investments made by individuals in the labour force, the returns are likely to be disproportionately reduced,⁹ implying private returns less than social returns, the latter being calculated exclusive of taxes. Again, the consequence is under-investment and a possible rationale for government subsidisation. We argue in the final section of this paper that governments need to audit their tax systems to determine how lifelong learning investment is affected at different stages of the life cycle.

Externalities

Where there are gains to society at large over and above those received by individual investors in lifelong learning (and these are not outweighed by the excess of costs to society less the costs to the individual) then individual investments will be less than optimal from a social point of view. Under such circumstances governments may wish to provide incentives for individuals to increase their investments, perhaps by subsidising their costs. Such arguments are freely used by interested parties when arguing that governments should provide greater support to the activities they favour. However, the existence of such externalities is often asserted rather than supported by empirical evidence. For example in the case of tertiary education it is often argued that society gains as a whole from having a highly skilled and trained workforce. Undoubtedly it does, but it does not follow from this that tertiary graduates do not reap these returns in terms of private benefits (earnings gains). It is a *non sequitor* to argue that private investments in tertiary education are insufficient because such education is important in general social and economic terms.

In the lifelong learning context one area where empirical evidence points to the existence of genuine externalities is ECEC, because early learning breeds success in subsequent education and because there is evidence that high quality pre-school programmes produce longer term social gains such as reduced teen pregnancies, reduced incidence of criminal activity, etc. In Chapter 4 we discuss an evaluation of the Perry Preschool Programme in the US which shows the net present value of participating in the programme to taxpayers and crime victims is over four times as large as the present value of net benefits to programme participants. In general,

ECEC would appear to be the component of lifelong learning where arguments for government support on externality grounds are strongest.

Other externality-type arguments apply to other aspects of lifelong learning. A well-known example is the free-riding problem relating to job training. In fact this argument is not as straightforward as is sometimes claimed. Standard economic analysis of training distinguishes between *general training*, whereby a trainee's productivity is increased wherever the trainee is employed subsequently and *specific training*, which only increases productivity in the firm providing the training. In the latter case the firm can pay the trainee less than his or her marginal product post-training because productivity is increased in the training firm only. The floor to the wage is set by productivity in outside firms. Firms can therefore finance such training without fear of losing their trained workers to competitors. There is no reason to presume that there will be insufficient specific training. In the case of general training however, the fact that a trainee's productivity is increased irrespective of where post-training employment occurs reduces or eliminates the incentives for firms to finance such training. Other firms could bid away the trained workers, profiting from their enhanced productivity without having contributed to the costs of training, *i.e.* free-riding on the firms who actually pay for the training. Fearing this, firms will be unwilling to invest in providing general training to their employees. We cite this argument because it has been influential in formulating government training policy. Strictly speaking, however, the poaching argument only applies to *employer* funding of general training. As the trainees benefit from the training – they are paid higher wages in line with their increased productivity – they ought to be prepared to finance it. The obvious way of doing so is by accepting lower wages during the training period. Thus, as in the case of firm-specific training there is no *prima facie* case for believing that there will be insufficient general training if decisions are left to private agents. Hence there is no need for government intervention.¹⁰ In the case where training is purely firm specific or truly general and labour markets are perfectly competitive, the free riding argument for intervention is incorrect.

Nevertheless, the poaching argument has held considerable sway with policy-makers. Believing that actual or anticipated poaching inhibits firms' supply of training, many governments¹¹ reacted by utilising either regulation or a system of levies and grants to compel employers to increase training.

This rationale is more compelling when labour market imperfections generate a genuine externality. Suppose labour markets are imperfectly competitive in the sense that, although firms compete for workers, this competition is insufficient to force the wage up to the value of the workers marginal product.¹² Under these circumstances, the basic Becker argument that firms will not finance general training breaks down and a possible externality arises. When firms are able to pay their workers less than the value of marginal product, even general training can benefit

the firm if it increases productivity by more than the accompanying increase in the wage.¹³ Firms in such markets would not automatically lose a worker who is paid less than the value of his or her marginal product. On its own this increases the supply of training by firms – they now have an incentive to provide transferable training which they do not when labour markets are perfectly competitive. However, if some generally trained workers choose to leave the firms that trained them, the firms to which they move will share the benefits of training without having incurred any of the costs. The training firm does not count the benefit to the free riders. Thus the argument that free-riding leads to sub-optimal training is resurrected.¹⁴ Levies or subsidies to trainees can, under these circumstances, internalise the externality and increase the amount of training supplied by firms. Because firms are making abnormal profits, any subsidies to firms can be recovered, at least in part, by a tax on profits.

Two other arguments in favour of government intervention in the training market relate to *externalities of market size* and to *unemployment*. The former argument rests on the proposition that a larger pool of skilled workers reduces the expected costs to firms of finding suitably trained workers to fill job slots, independently of the price of skilled labour itself. As individuals and firms do not take this into account when making their training investment decisions, it is quite conceivable that there will be insufficient training from the social point of view. The unemployment argument asserts that where unskilled workers suffer substantial unemployment while skilled workers do not, training an unskilled worker to qualify for a skilled job has greater social than private net benefits. The essential point is that on the cost side the economy loses no output in the unskilled labour market due to the excess of labour supply. Correspondingly, on the benefit side the economy gains the full marginal product of the newly trained worker rather than the productivity *differential* between skilled and unskilled workers, which would be the benefit of such training in a labour market with no unemployment.

Intervention in employment training

When training is sub-optimal due to capital market imperfections, the government can either directly offset capital market imperfections by supplying loans at below market rates to potential trainees or by subsidising training costs. At least some of the cost of this subsidy can be recovered by taxes on post-training wages. Directly offsetting the effects of risk by providing income insurance is less attractive because of moral hazard problems.

A broader view of the role of government in lifelong learning

To complete this section on the role of the state a more speculative note is sounded. Our analysis of the rationale for government intervention has followed

the conventional approach of the correction of market failure. It is, however, possible to take a broader view of the role of the state in lifelong learning than simply as an agent to internalise externalities and offset capital market failures. For example, basing their argument on the role of governments in promoting education and training in a sample of Asian "tiger" economies (Korea, Singapore and Taiwan), Green *et al.* (1999), argue that "given the long-term and social nature of the skill formation process and an economy's needs for the rapid expansion of skills, the state can under certain circumstances perform a matching function for skills supply and demand, superior to that afforded by market processes." One example provided by the authors relates directly to lifelong learning in Singapore in the 1980s. As the economy converged to OECD growth rates and towards frontier technologies, it was perceived that there remained many workers with inadequate basic skills (in mathematics, literacy and IT) who were likely to become vulnerable at lower (but sustainable) growth rates. In response, the Singaporean government's Vocational and Industrial Training Board launched a series of training schemes to upgrade the skills of mature workers still in employment who had not progressed beyond primary education in the 1950s. Financed in part by a levy on the employment of low paid labour, the programmes, both on and off the job, enabled such workers to continue their education to secondary level or to augment their work-related skills. Another example of successful strategic government intervention was the role of the Korean government in promoting vocational education, offsetting the private preferences of pupils and their parents for more academic learning. Academic education is sometimes preferred for reasons of pure status, but vocational education may also be eschewed by individuals as being too risky. In such cases the state may be less risk-averse and may be able to modify private decisions by promoting a comprehensive lifelong learning strategy which partially insures individuals against the risks of uncertain human capital investments.

The conditions which made widespread state intervention in education and training successful in the Asian tiger economies are not likely to apply widely throughout the OECD economies. Indeed, current trends within the Asian economies are towards more decentralised decision-making. Nevertheless, where it can be legitimately argued that the state should take a longer view than private agents and/or that the state possesses some informational advantage or where it can diversify risks to a greater extent, there may be a more general strategic role for the state than is implied by conventional analysis. At a general level, this is likely to require the state not to take as exogenous the preferences of individuals and firms but to promote a culture of lifelong learning on both sides of the labour market. This will require further integration of educational and industrial policy and the creation of partnership institutions such as national skills task forces in which the main interested parties can co-operate in diagnosing current and expected skills bottlenecks and devising lifelong learning solutions.

6) *Equity arguments for government intervention in lifelong learning*

We know as a technical matter (albeit under fairly restrictive conditions) that competitive markets deliver an efficient allocation of resources in the sense that resources cannot be reallocated in such a way as to make one individual or group of individuals better off without making another individual or group worse off. While efficiency in this (Pareto) sense is generally desirable it tells us nothing about the fairness of the resulting distribution. Most governments do have equity or fairness objectives as well as pursuing efficiency, although different political parties and different countries will assign different weights to efficiency and equity objectives. Nevertheless, a number of equity issues arise in the lifelong learning context. Such considerations will influence policy. They may for example induce governments to pursue lifelong learning programmes even where the conventionally calculated rates of return are too low to justify proceeding on efficiency grounds.

Equity here is not conceived purely in terms of some summary measure (such as the Gini coefficient) of the distribution of household incomes. There is concern for equality of access to all levels of lifelong learning and ensuring that no group is excluded from the opportunities and benefits that lifelong learning can provide. Groups that risk exclusion, to different extents in different countries, include older persons, those with poor initial education, the long-term unemployed and (to a lesser extent than in the past) women. Many countries already have in place policies that attempt to reduce passive benefit reliance among the vulnerable groups and draw them into training, work experience and eventually stable employment. Due to public sector budget constraints the pursuit of equity objectives is likely to take the form of targeted or means-tested support for lifelong learning costs rather than universal entitlements, in spite of some well-known disadvantages of means testing (low take up, poverty traps, etc.).

Equity and equality of opportunity is probably the rationale for the central role taken by the state in the provision of primary and secondary schooling. We do question below whether equity really requires government *provision* rather than financial support and argue that a greater measure of competitive supply could be introduced into compulsory schooling. When it comes to tertiary education, equity grounds lie behind calls for greater cost sharing. The argument, in brief, is that students receive substantial private benefits over their lifetimes, but bear a disproportionately small share of the costs. Thus, increases in fees and the substitution of loans for grants are seen as being equitable as well as helping to limit the public cost of the rising demand for places in tertiary education. Even where loan repayment is income contingent (not *all* tertiary graduates end up with above average incomes) many advocates of greater cost sharing also advocate a safety net of means-tested grants and scholarships for able but poor students, for whom higher costs would deter them from enrolling.

We also argue in subsequent chapters that equity considerations provide a rationale for government support of pre-school education and care and lifelong learning programmes to retrain older and/or poorly qualified workers. In the case of ECEC, efficiency and equity arguments both point in the same direction, but for older workers equity considerations may persuade governments to subsidise retraining even though conventional rate of return analysis would not justify doing so.

Notes

1. Turkey, Greece, New Zealand, Portugal, Denmark and Italy.
2. Initial estimates were prepared by the OECD Secretariat for the Education Ministerial Meeting in 1996. These were refined in OECD (1999) and in some of the individual country reports summarised in OECD (2000a).
3. Turkey and Mexico regularly are shown to have the most to achieve in order to reach median or good practice provision.
4. Throughout this paper we are treating lifelong learning expenditure as investments rather than current consumption. While it may be the case that there are some aspects of lifelong learning which are primarily consumption, some adult education courses which are essentially for leisure and social purposes, for example, these are likely to comprise a relatively small proportion of total lifelong learning expenditure.
5. See, for example, Chapter 2 in Layard, Mayhew and Owen (1994).
6. Risk and uncertainty could have been discussed as types of capital market failures in the sense that perfect capital markets would enable students and trainees to insure their future incomes. Standard insurance problems such as moral hazard and adverse selection discourage widespread availability of income insurance.
7. In addition less risk averse individuals are likely to have self-selected themselves into entrepreneurial occupations.
8. The worker's post-training wage is reduced irrespective of where he or she is employed, but supply is only increased to the extent that trainees are expected to be retained post-training.
9. Because, especially for full-time courses, the appropriate tax reduction to foregone earnings is the *average* tax rate while returns are reduced by the *marginal* tax rate. In almost any real world tax system average tax rates are less than marginal rates for most individuals contemplating lifelong learning investments.
10. Of course, if minimum wages or other labour market rigidities prevent trainees financing their training by low initial wages, there could be an inadequate supply of willing trainees. Whether the appropriate response is a training subsidy rather than addressing the original rigidity in the labour market is, of course, another question.
11. In the UK, for example, Industrial Training Boards, implementing the requirements of the Industrial Training Act, operated a levy (and grant) system from 1964 until 1982. Although the system was to a large extent abolished by the Conservative government, remnants remain; for example the Engineering Construction ITB retains the power to impose a training levy of 1.5% of the wage bill.
12. The extreme case is that of pure monopsony, where there is a single employer. All that is required for the argument in the text is that there is a wedge between the wage and

the marginal product; firms' ability to hire and retain labour depends on the wage they pay. This is consistent with a degree of competition between employers, ruled out by definition in the pure monopsony model.

13. Providing general training may also help in recruitment and retention of workers.
14. Under such circumstances Stevens (1994) has shown that it is also possible that firms and workers will respond by *over*-investing in firm-specific human capital; because such investments reduce mobility of workers this reduces the chance of outside firms capturing the benefits of transferable training for which they have not paid.

Chapter 4

Costs and Benefits

1. Introduction

How can evidence on the costs and benefits of existing education and training guide us in establishing the outline of an integrated lifelong learning strategy? Does this evidence point to ways of increasing the cost-effectiveness of learning at different stages of the life cycle?

What do we know about costs and benefits of existing educational and training programmes? Put simply, what works? Can we use the answers to these questions to highlight programmes that may be extended so as to play a fuller role in a strategic lifelong learning plan? Do the answers suggest where it may be possible to increase benefits or reduce costs to revitalise programmes that currently are regarded as not working? These are some of the issues dealt with in this chapter.

The approach is to focus more closely on lifelong learning issues, including funding, that occur at some specific stages of the life cycle. This is done in part for expositional convenience. As argued throughout this paper, one of the corollaries of the lifelong approach to learning is the necessity, when considering the net benefits of specific human capital investments, to consider interdependencies between such investments. In general, this implies that the returns to earlier investments are greater than returns to later investments because the productivity of the latter are augmented by the former. Conversely, the costs of correcting under-investment increase with the age of the individual. We will spell out these points in more detail below.

In this paper it is not possible to cover all lifelong learning related learning topics; the subject is simply too vast. Purely for reasons of brevity, this chapter pays somewhat less attention to the compulsory years of formal education, emphasising instead pre-school, upper secondary and tertiary education and to lifelong learning issues relevant to youth and adults not enrolled in formal education.¹ One reason for this is that enrolment in primary and lower secondary education is near-universal in OECD countries. This does not, of course mean that there are no relevant issues – there are and we touch on them below. A fuller study

would pay more attention than we are able to here to quality and curriculum issues and to administrative/financial issues such as the respective roles of central and local governments at these levels of education.

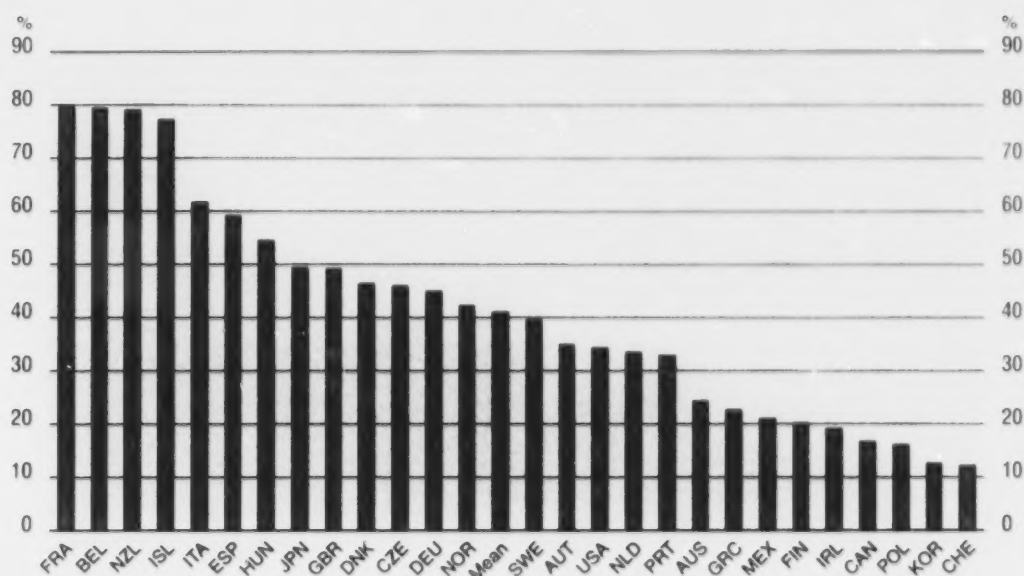
As well as providing the context for sector specific discussion, the data should be read in conjunction with the description in Chapter 3 of the "participation gaps" methodology. Although we do not formally use that methodology in the current paper, these figures will give an idea of where such gaps may arise in each country that might wish to adopt a "good practice" methodology. Of course, this approach ignores qualitative aspects that are important to a successful lifelong learning strategy.

2. Early childhood education and care

a) Empirical background

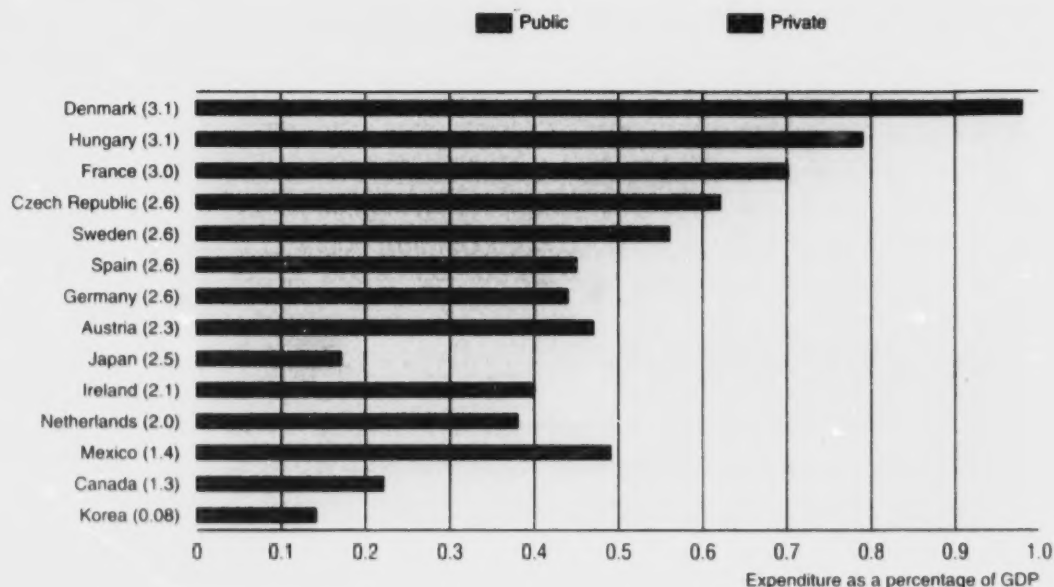
Figure 8 demonstrates considerable variability across OECD countries in enrolments of young children in ECEC.

Figure 8. Enrolment of children aged 2-4 as percentage of population aged 2-4 in public and private institutions (full-time and part-time), 1996



Source: OECD (1998).

Figure 9. Expenditure on pre-primary education as a percentage of GDP, 1995



Note: The figures in parentheses give the average number of years in pre-primary education.

Source: OECD (1999).

Clearly some countries have wide coverage (Belgium, France, New Zealand and Iceland having nearly 80% of the age group enrolled, approximately twice the OECD average) while even some of the more affluent countries in the OECD (USA, Canada, Finland, Austria and the Netherlands) have under 40% enrolment. Of course this only captures institutional enrolment; informal early childhood and care is omitted. Clearly there are participation gaps (see Chapter 3, Section 2) to be filled in this sector by many countries. The figure is only intended to give some picture of the degree of cross-country variation. Many other dimensions of early childhood and care in particular amounts (measured say in hours per week) and quality are important.

Expenditure as a proportion of GDP also vary considerably, as Figure 9 shows for a selection of OECD countries. The figure also shows that this index is related quite closely to the average number of years in pre-primary education. The data on which the figure is based refer, as in the previous figure, to organised, centre-based instruction programmes, in this case primarily covering children aged three to compulsory school age. Again, many informal day-care programmes, play groups and home-based programmes are excluded. For further background data on early childhood and care see Verry (1998) and OECD (1999).

b) Rationale for government subsidies for ECEC

Market imperfections

One class of such imperfections relates to capital markets. If all parents could borrow against their own or even their children's future income at the same interest rate, investments in ECEC would not require current sacrifices and would not be dependent on parental income. But economists have noted repeatedly that, for reasons of moral hazard and adverse selection, human capital is poor collateral for those wishing to borrow to finance education and training. Risks of default are high for a number of reasons. In particular, where repayments are income-contingent moral hazard arises; earnings, and hence repayments, can be kept low by occupational choice and/or by labour supply decisions. Furthermore, if the debts have been contracted not by children themselves but by their parents, society may be unwilling to enforce collection on moral grounds; this argument is likely to apply with special force to ECEC, given the age of the child when its parents incur the debt.

With imperfect capital markets, parental investments in their children are likely to be constrained by family incomes and savings; thus the cost of resources invested in children varies across families. In these circumstances, even if parents took the full range of costs and benefits into account their investments would not, in aggregate, be efficient. Relaxation of borrowing constraints could, in principle, improve the allocation of resources. Whether this is best achieved by intervention in the capital market or by subsidising ECEC is not obvious. Nevertheless, the use of direct subsidies, tax credits and/or childcare vouchers has been supported on grounds of capital market imperfections in order to secure more efficient levels and patterns of investment in children.

Externalities

Even where capital markets do not constrain household investment decisions, efficient outcomes will not result if private decision-makers do not take into account the full range of costs and benefits when making decisions about their ECEC expenditure. Under such circumstances is it possible that ECEC provides benefits to society as a whole in excess of those accruing to the households demanding it? If so, this would again provide a rationale for government intervention in order to equate *social* rather than private costs and benefits at the margin. Note that the mere existence of positive externalities does not determine the *type* of intervention that deals most efficiently with the externality in question; regulation, tax credits or direct subsidies may all help to "internalise" externalities. What are the relevant externalities that society may reap with extended ECEC provision?

One of the externalities increasing the returns to ECEC derives from the synergy between early and later skill formation. As Heckman (1999) puts it: "Early learning

begets later learning and early success breeds later success just as early failure breeds later failure." Thus, ECEC investment not only increases private returns (and hence the optimal amounts) of later human capital investment, but reduces unit costs in primary and secondary schooling by reducing repeating rates (grade retention) and increasing completion probabilities. If families fail to take account of these later effects society may under-invest in ECEC.

We examine below the evidence for other types of externalities relating to social outcomes as various as welfare reciprocity, propensities to teen pregnancy and criminal behaviour (as measured say by arrest rates). Furthermore, there is good evidence that high quality ECEC programmes improve social skills and motivation, often ignored in academic studies in favour of examining programme effects on cognitive skills.

Informational failures

The above discussion has concentrated on two types of market failure: capital market imperfections and externalities. This is not an exhaustive list. Other types of failure could also generate a role for public policy. There may be information failures in the ECEC market. For example, families may be poorly informed about the effects on their children of different types and qualities of ECEC, about the range of suppliers or about the quality of service provided by suppliers they do know about. Under certain conditions (see Walker, 1991) these informational problems could be dealt with by publicly provided information on suppliers and/or by government regulation. Alternatively, subsidies selectively supporting high quality providers could induce and increase in the quality of ECEC purchased by parents.

Dynamic effects on government budgets

ECEC subsidies, by increasing labour force participation of parents, can assist low income households to free themselves from dependency on state benefits and achieve lasting economic self-sufficiency. Even if current ECEC subsidies for low income working parents were more expensive than current welfare support, the fact that employment increases human capital and reinforces work habits could generate long run savings in welfare in excess of the value of limited duration ECEC subsidies. This benefit of government subsidies is independent of the effects of ECEC subsidies on *children* and such subsidies tend not to restrict the type or quality of the childcare that can be purchased. This raises an issue which is perhaps under-researched in the ECEC literature: is there a trade-off between the policy goals of increasing the labour force participation of mothers and of improving child outcomes? Blau (2000) finds some evidence that there is. A subsidy designed specifically to achieve one of these goals will usually be relatively ineffective in achieving the other.

Equity and paternalism

Policy interventions may also be justified if state provided or subsidised ECEC would help to promote society's anti-poverty or equity goals. This would seem to be the implicit rationale for many programmes targeted on children in underprivileged backgrounds, such as Head Start in the United States. Without compensatory assistance, children from such backgrounds do not start their formal primary schooling on a level playing field with their peers from more privileged backgrounds. Without assistance not only are these children likely to experience inferior ECEC, at least from the point of view of being in a structured learning environment, but ECEC costs are a greater burden to their families than to wealthier families.

It can be argued that it is more cost-effective for an inequality averse government to attempt to equalise early endowments than to compensate for unequal outcomes later in life. Not only does early disadvantage beget later disadvantage, but evidence on adult training programmes suggests that it is more difficult to design effective programmes to compensate for cumulated disadvantage.

Certainly, in the United States and Great Britain, and probably in other OECD countries also, household surveys provide evidence of the regressive nature of such expenditure. For example, Casper (1995) using data from the Survey of Income and Programme Participation for 1993 discusses a number of dimensions of inequality in ECEC in the US. ECEC expenditure form a larger proportion of family income for low income families and for families below the poverty line than for wealthier families. It is likely that the inequality is even greater than such data indicate because higher income families may be expected, on average, to purchase higher quality ECEC; *i.e.* standardised for quality, the expenditure would be even more regressive. Putting the quality question aside, for the welfare-to-work and working poor populations childcare costs of the order of 25% of family earnings are likely to be significant barrier to employment for mothers in such families. Where the burden of providing ECEC is as unequal as this, governments seeking to ensure equality of opportunity and reduce the intergenerational transmission of inequality may well conclude that there is a *prima facie* case for subsidising low income families.

An alternative approach to targeting government assistance on equity and anti-poverty grounds is to direct such assistance to single parent households. Labour force participation is lower for single parents and, where single parents do work, their hours are shorter than are the hours of working parents in general. These factors place single parents and their children at risk of having low income, even of falling into poverty. To the extent that young children prevent lone parents from working on the one hand, and that increased labour force participation,

and increased hours of participants, offer an escape route from low income and poverty for single parent households on the other, the equity case for targeting ECEC assistance to lone parents is compelling.

Furthermore, given the vital importance of ECEC as a foundation for later learning and development, the case for paternalism is probably stronger for very young children than later in the life cycle. Dysfunctional families and inimical social environments can do lasting damage, and many would argue that early intervention to offset these disadvantages may be justified on paternalistic grounds if not on others. Although it may be possible, and this is by no means certain, to remedy later in life some of the adverse consequences of inadequate early investments, the later such remediation is left the more costly it is likely to be.

c) Private and social benefits of ECEC: evidence

Recent research, which has largely been conducted in the US (although OECD, 1999, cites studies conducted in other OECD countries) demonstrates the importance of skill formation in early pre-school years during which family and other non-institutional environments shape abilities and motivation. Here we present a very selective example of the type of evidence that has been adducted.

One of the most studied high quality ECEC programmes in the US is the Perry Preschool Program.² Some results from this programme are presented in Table 7. First, raw differences between the experimental (programme) group and the control group are shown. Second, some benefit-cost figures from the project are reproduced and discussed.

The table would seem to show clear differences between the groups in educational, economic and social dimensions. Note that because these benefits are measured at age 27 they measure persistent benefits (in fact in the whole study, evidence that pre-school benefits are transitory only exists for gains in childhood intelligence test scores). The pre-school programme would appear to have had beneficial effects on its subjects. This does not mean that the project was "worthwhile" in an economic sense. To know whether that is indeed the case two further steps are required; the benefits have to be given monetary values, and the sum of these has to be compared with the costs of the programme.

An attempt to do such cost-benefit calculations was made based on the information available when the subject and control groups were aged 19 and 27. Table 8 (from Edward Gramlich's commentary in Berrueta-Clement *et al.*, 1984) shows the benefits and costs, shown separately for participants and the rest of society, on the basis of data collected when participants were age 19 having spent one year in the Perry Preschool programme.

Table 7. Some major findings from the Perry Preschool Study

Panel 7a. Educational benefits (measured at age 19 unless otherwise specified)

Percentage (unless stated otherwise)

		Experimental group	Control group
1	Average or better literacy	61	38
2	High school graduate or equivalent	67	49
3	Percentage of years in special education	16	28
4	Mean high school GPA (A = 4, B = 3....)	2.09	1.68
5	Reading achievement (age 14)	31.5	21.7
6	Arithmetic achievement (age 14)	31.5	25.0
7	Language achievement (age 14)	46.5	34.8

Note: Rows 5-7 are raw scores from the California Achievement Tests. All group differences are significant at $p < 0.05$ (two-tailed); to say that the differences are significant at the 0.05 level means that they would occur by chance no more than 5 times out of 100.

Panel 7b. Economic benefits (measured at age 27)

Percentage (unless stated otherwise)

		Experimental group	Control group
1	\$2 000 or more monthly earnings	29	7
2	Mean annual earnings	\$13 328	\$11 186
3	Currently employed	71	59
4	Month unemployed in previous 2 years	5.7	8.0
5	Homeowner at age 27	36	13

Note: Group differences are significant at $p < 0.05$ (two-tailed), except row 2 ($p = 0.069$), row 3 ($p = 0.181$) and row 4 ($p = 0.289$).

Panel 7c. Social benefits (measured at age 27 unless otherwise stated)

Percentage (unless stated otherwise)

		Experimental group	Control group
1	Ever detained or arrested (age 19)	31	51
2	5 or more arrests by age 27	7	35
3	Received social services in past 10 years	59	80
4	Pregnant during teen years (% of females)	48	67
5	Mother during teen years (% of females)	44	54

Source: Berrueta-Clement *et al.* (1984); Schweinhart (1993).

Schweinhart (1993) conducts a similar analysis on the basis of observing the experimental and control groups at age 27. Looking just at the net present value and the benefit/cost ratio the author derives the following figures in Table 9.

Table 8. **Per-child benefits (+) and costs (-) of one year participation in the Perry Preschool Programme**

1981 US\$, present values (discounted at 3%)

	Programme participants (and families) (1)	Taxpayers and potential crime victims (2)	Society (1) + (2)
Measured benefits (+) and costs (-), to age 19			
Operating and capital costs of preschool programme	0	-4 818	-4 818
Child care	290	0	290
Educational cost saving	0	5 113	5 113
Earnings increases	482	161	643
Welfare reduction	-546	601	55
Crime reduction	0	1 233	1 233
Subtotal	226	2 290	2 516
Predicted (+) and costs (-), age 19+			
College costs	0	-704	-704
Earnings gain	19 233	4 580	23 813
Reduction in welfare			
Payments	-14 377	15 815	1 438
Crime reduction	0	1 871	1 871
Subtotal	4 856	21 562	26 418
Total (net present value)	5 082	23 852	28 933
Benefit/cost ratio	1.34	5.32	6.24

Source: Berrueta-Clement *et al.* (1984).

Table 9. **Benefits and costs of the Perry Preschool Programme, age 27**

	Programme participants (and families) (1)	Taxpayers and potential crime victims (2)	Society (1) + (2)
Net present value (1992 US\$)	19 570	76 077	95 646
Benefit/cost ratio	8.38	6.75	8.23

Source: Schweinhart (1993).

Naturally, there is much that can be disputed in the way the benefits of the programme have been measured (readers are referred to the original sources for details). Furthermore, major uncertainty must attach to the projected earnings differentials and crime reductions over the remainder of the working life from age 19 (or 27). Nevertheless, these figures do indicate such large net gains (and high benefit/cost ratios) that even if the benefits are substantially overestimated it seems

03

unlikely that the project would not be worthwhile in net present value terms. It is also interesting to note how much larger the net present value is to the "taxpayer and potential crime victims group" compared to the value to participants in the pre-school programme itself. This could be interpreted as providing *a priori* grounds for governments to subsidise such projects.

It *does* seem to be the case that the more intensive, longer and higher cost per child programmes such as the Perry and the Syracuse Preschool Scheme have larger and longer lasting effects than the more universal and cheaper programmes such as Head Start, which has shorter periods of intervention, lower paid staff and limited parental involvement.

It also seems to be the case that targeted programmes, carefully designed to meet the needs of the target group, are likely to be good investments. But it is extremely difficult to extrapolate the results of such studies to different groups in different circumstances. For example, while one may accept the positive findings reported for the Perry Preschool Programme, we are not justified in using these findings to underpin more general expansion of ECEC to the whole population of pre-schoolers. For one thing, the sample sizes of the Perry experimental and control groups are just too small. For another, the programme, perfectly understandably, was targeted at very disadvantaged children. The gains, both to participants and society at large, that were observed in the programme evaluation may not apply to a project which expands provision of ECEC to less disadvantaged children (unlikely, simply on a statistical basis to be involved in truancy, delinquency and crime to the same extent). Barnett (1995) cites evidence that age of entry to, or years of experience in, day care during pre-school years influenced early test scores (ages 5 and 6) differently for children from and high and low income homes. Early entry and/or more years in care had positive effects on scores from children from poor homes but *negative* effects for children in the highest income families. A possible explanation is that where the home environment is particularly conducive to cognitive development children will do worse outside the home, whereas children from home environments that are less supportive gain most from ECEC outside the home. If this is true it has obvious implications for the ability to extrapolate results from programmes for disadvantaged children to a more typically heterogeneous population. In general, we do not know to what extent the results from expensive high quality model programmes targeted at specific population groups would generalise to larger scale programmes which are less specifically targeted and would in all probability have to operate with fewer resources per child than the model programmes. To what extent would slightly lower quality programmes generate positive but proportionately lower benefits? Is the relationship between size and effectiveness non-linear; *i.e.* is there some quality threshold below which benefits fall away sharply?

Probably our best evidence of large scale ECEC programmes comes from the US Head Start programme. Although targeted at disadvantaged children, Head Start is much larger than most model programmes, enrolling about 800 000 children in 1999, although even this number only constitutes about 35% of eligible three and four year-olds. Evaluations of Head Start and other ECEC programmes are summarised in Currie (2001). She finds that Head Start, in spite of variations in quality across different centres, is associated with short-term gains in cognitive skills as well as longer term gains in school completion. Head Start helps children avoid grade repetition and placement in special track education. However, evaluations also suggest that some of these gains are subject to "fadeout"; the gains in cognitive test scores, for example, begin to disappear by the time the children reach third grade. There is some suggestion that fadeout is greatest for children whose post-ECEC is of poor quality and is not, therefore, inevitable. Currie estimates that the short- and medium-term benefits of Head Start offset between 40% and 60% of programme costs. Longer term benefits have not been evaluated, but she argues that "even relatively small long-term benefits of such a programme may be sufficient to offset the costs of public investment". The Perry evaluation suggests that such long-term benefits are likely to be substantial.

Furthermore, as noted above the experimental design, which compares outcomes for the programme group and the control group, is unable to identify separate contributions of the different components of the Perry programme to its overall success.³ One possible exception is the curriculum component. There is some evidence that children who follow the High/Scope active learning curriculum perform better on academic tests and have superior social and behavioural characteristics than children following alternative curricula (Weikart and Schweinhart, 1991).

d) Financing implications

One of the implications of the US findings is that high quality ECEC programmes of kind where net benefits, private and social, have been clearly established, do not come cheaply. There are several reasons for this but, in essence, such programmes rely on high staff/child ratios and utilise highly trained staff.

When we discuss tertiary education funding we will be advocating reforms involving a greater degree of cost sharing than most countries generally adopt. Can similar arguments be made in the case of ECEC? Probably not. One means of cost sharing is to persuade parents to remain at home with their children in the early years. But this runs counter to one of the main benefits of ECEC – allowing greater labour force participation for mothers and reducing welfare dependency. Some countries place so much weight on these latter objectives that the receipt or level of ECEC subsidies are conditional on labour force participation. In Germany and Sweden policy is less biased to parental participation, acknowledging both the benefits of parental care and the cost

saving it generates. Even where parents take a greater share of ECEC responsibility, complementary programmes (parental education, centre-based sessions to provide socialisation, etc.) will incur substantial costs.

As in all sectors, there will be scope in ECEC for using existing resources more effectively (avoiding duplication of services, identifying "dormant" resources such as unused buildings, exploiting voluntary labour, etc.). Nevertheless, a major expansion of ECEC in terms of both quantity and quality will certainly require the mobilisation of additional resources. There is some scope for utilising the tax system to provide incentives for employers to take a greater role in ECEC provision as well as offering more generous parental leave. Of course, if firms are forced to expand their provision, there will exist some uncertainty as to the final incidence of the ECEC costs they incur; they could be passed on in terms of higher prices, lower wages or minimised by discriminatory hiring policies. Tax incentives may also be used to leverage funds from the voluntary sector and to encourage private start-ups in ECEC provision.

In terms of equity goals, any cost recovery from public supply, and subsidised use of privately provided ECEC, needs to guard against low income parents having access only to low quality ECEC, often purely custodial, while more affluent parents are able to afford higher quality more structured programmes. The Perry Programme and to a lesser extent Head Start in the US show that children from disadvantaged backgrounds benefit enormously from high quality ECEC.

Most countries do charge parents fees in publicly provided ECEC. Often these are means tested, and in terms of equity this is sensible where universal subsidisation is too expensive. Of course this can impose high implicit marginal tax rates on households as income increases. There is also a growing use of attendance related fees. Again, this is sensible in terms of cost-recovery but can induce poorer households to limit their use of publicly provided services.

e) ECEC: Summary and crucial policy issues

The analysis in this section supports the view that ECEC investments provide a good social return; there are compelling efficiency and equity arguments for governments to provide as wide as possible access to high quality ECEC. However, as in other areas of lifelong learning, funds are limited. Furthermore, we argued that the case for cost sharing may be less compelling than for other components of lifelong learning. In such circumstances it probably makes more sense to expand the coverage of programmes for disadvantaged children (*i.e.* to target low income and single parent households), for whom the evidence of high net returns is strongest, than to aim for universal coverage.

Apart from the issue of universality versus selectivity in the provision of ECEC, a number of pedagogical issues need to be considered as part of a lifelong

learning strategy. One of these is the balance between cognitive and non-cognitive components in ECEC programmes. For example, some Head Start evaluations have argued for greater emphasis on academic goals such as reading readiness (or, more generally, school readiness) and general language and literacy skills. However, this is not to deny the importance of non-cognitive skills; the question of the actual content of ECEC programmes is a subtle one and does not lend itself to easy generalisation.

Another issue is the *optimal age for intervention*. Some recent brain research,⁴ aided by advances in brain imaging technology, has highlighted the first three years as critical for brain growth. Some of this research suggests the rapid growth of the brain in these early years provides the opportunity for learning arrangements to play a part in its development, actually influencing circuit development. However, it would probably be premature to conclude that public policy should give higher priority to ages birth to three- than to four- and five-year-old pre-schoolers, nor that interventions directed at this group come too late. Demonstrating that the first three years are important in brain development is not the same as proving that extra stimulation in specific learning environments produces lasting benefits for normal children. The US National Research Council (2001) has recently concluded that "It is important (...) to caution against thinking that brain research is directly applicable to instruction and pedagogy. There are many popular accounts and heavily promoted learning programmes that make that leap, but so far, there is no evidence of the effectiveness of particular educational programmes, methods, or techniques on brain development".

The cost per child of ECEC depends on the quality of provision. Because of the diverse nature of ECEC it is difficult to be precise about what constitutes a high quality pre-school programme. Certain structural dimensions of quality are relatively easily measurable; child-adult ratios, class size, teacher experience and qualifications. Less easily quantifiable are "process" factors such as the nature of adult-child interactions, the cognitive stimulation children receive, etc.⁵ Due to high variation in the quality of existing provision, information asymmetries between parents and providers and the harmful potential of poor quality ECEC, governments need to consider whether quality is best ensured by state provision, government regulation of private providers or a mix of the two.

Even accepting the economic and educational arguments for making ECEC a high priority in an overall lifelong learning strategy, resources will be scarce; every effort should be made to ensure cost-effectiveness, to recover costs from more affluent households, and to mobilise resources from social partners. In spite of these efforts, increased public funding of ECEC will probably be necessary, especially in those OECD countries where current provision leaves substantial gaps in participation or where coverage for low income households is essentially custodial.

3. Primary and secondary schooling

In these sectors, at least up until the early to mid-teens, participation in OECD countries is near-universal so, as argued in the introduction to this section, the emphasis of reforms relevant to lifelong learning is likely to be on quality and cost-effectiveness.

In Chapter 2 we adduced evidence indicating that the compulsory sector in many OECD countries may not be performing as effectively as many would like, especially as students receiving schooling in the compulsory sector have their direct costs fully subsidised. This evidence was of two types: firstly, evidence coming from international comparisons of student achievement and, secondly, evidence indicating the existence of high levels of adult illiteracy even in countries with high levels of educational participation. These skill gaps must in part reflect failures of the school system, although undoubtedly family background factors also contribute significantly. They imply the need to target illiteracy and, more generally, to improve the quality of learning for lower ability children.

There is now a large body of evidence, mainly produced in and relating to the United States, about the effects of primary and secondary spending per pupil, teacher salaries, class size and material inputs on educational and economic outcomes. The weight of the findings suggests that money spent on improving these commonly used indices of school quality is, at best, likely to have very uncertain results. One possible reading of the evidence suggests that such expenditure are generally not cost-effective.

Some of this research attempts to relate expenditure per pupil, class size or other presumed quality indicators to test scores, while another body of literature relates them to the subsequent earnings of pupils. In both dimensions, the results are inconclusive. Surveys by Hanushek (1986, 1996) and analysis by Heckman *et al.* (1996, 1997) either fail to find clear positive effects of increased spending or demonstrate that positive effects depend crucially on *ad hoc* assumptions. Heckman *et al.* (1997) show, for US high schools, increasing spending per student by 10% produces negative net discounted returns using the largest rates of return to labour market earnings found in the literature. Card and Krueger (1996), while acknowledging that some results are not robust, take a slightly more optimistic view of the effects of increased spending, while the results of the Tennessee Star experiment finds a clear negative relationship between class size and test scores (Krueger, 1999; Krueger and Whitmore, 2001). Whether such results would generalise to a wider population in a non-experimental setting is not clear. Of course, at very low quality levels increases in per pupil expenditure, class size and teacher salaries may have a much larger effect on quality than the typical US finding (see Behrman and Birdsall, 1983). But marginal increases in expenditure at current levels of school quality in many OECD countries are not likely to be cost-effective policy.

This is not to say that nothing can be done to improve primary and secondary school quality. Curriculum reform, identification and widespread adoption of best-practice teaching techniques, the use of "literacy hours" and other remedial devices may all be effective. More fundamentally, casual observation suggests that in many countries young people have less self-discipline and are less motivated than their predecessors. Teachers and parents would probably agree that reviving and strengthening the learning culture among children and youth could transform schools. Unfortunately there is little certainty about how this can be achieved.

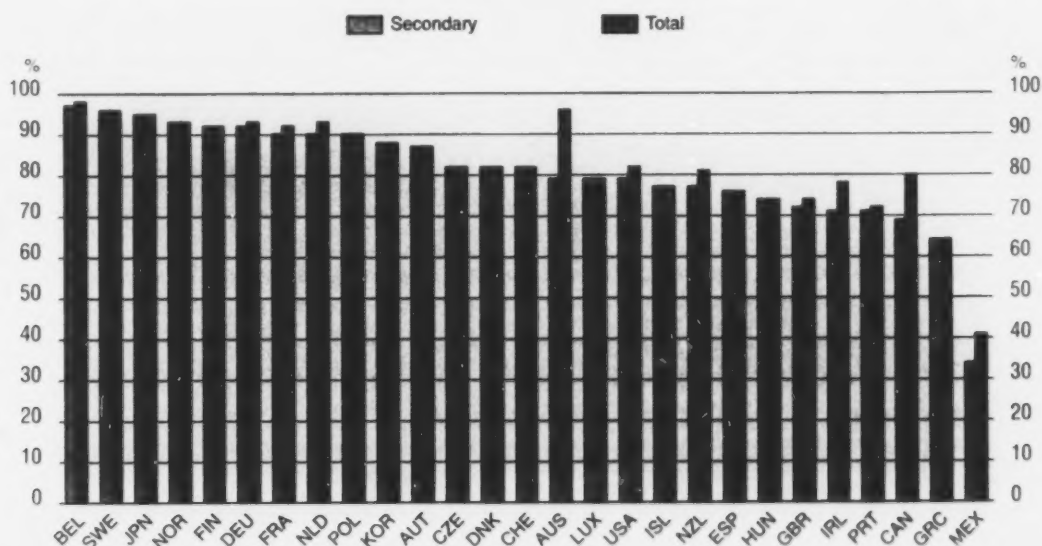
While surely not a comprehensive solution to such problems of culture and motivation, it is worth mentioning a genre of creative programmes targeted at adolescents from disadvantaged backgrounds who are still enrolled in formal schooling. Again most evaluation of these relates to the US. One class of such interventions is *mentoring programmes*. The Big Brothers/Big Sisters (BB/BS) programme pairs adult volunteers with adolescents from single-parent households while Philadelphia's Sponsor-a-Scholar (SAS) programme provides long-term mentoring throughout high school and one year beyond. This programme, unlike BB/BS, which offers broad support and friendship, is carefully structured to increase the chances of participant's progress from secondary schooling to college. Indeed, in addition to mentoring, SAS provides financial assistance for participants who enrol in an approved tertiary institution. The Quantum Opportunity Programme (QOP) offered financial incentives and mentoring for participation in programmes aimed at improving both social skills and market readiness. Other programmes have been targeted at teenage parents, encouraging them to stay in school. Evaluations of these programmes cited in Heckman (1999) show that they have clear benefits both in terms of schooling outcomes (grade point averages, reduced truancy, college attendance) and social skills (reduced drug and alcohol use, less aggressive behaviour, better relationship with parents).

4. Upper secondary and school to work transition

a) Empirical background

Because of the wide range of ages and activities covered by upper secondary and school to work transition, we approach the task of providing an empirical background from two perspectives. The next figures consider actual enrolments in formal education for young people. Between the ages of 17 and 20 young people still enrolled in education are shifting from secondary to post-secondary education so looking at either one will not give an accurate picture of how countries differ in their ability to retain young people in the education system. Therefore, Figures 10 to 13 show enrolment rates both in secondary and other educational levels for the ages 17 through 20. At age 17, most enrolment is in secondary schooling (Australia and

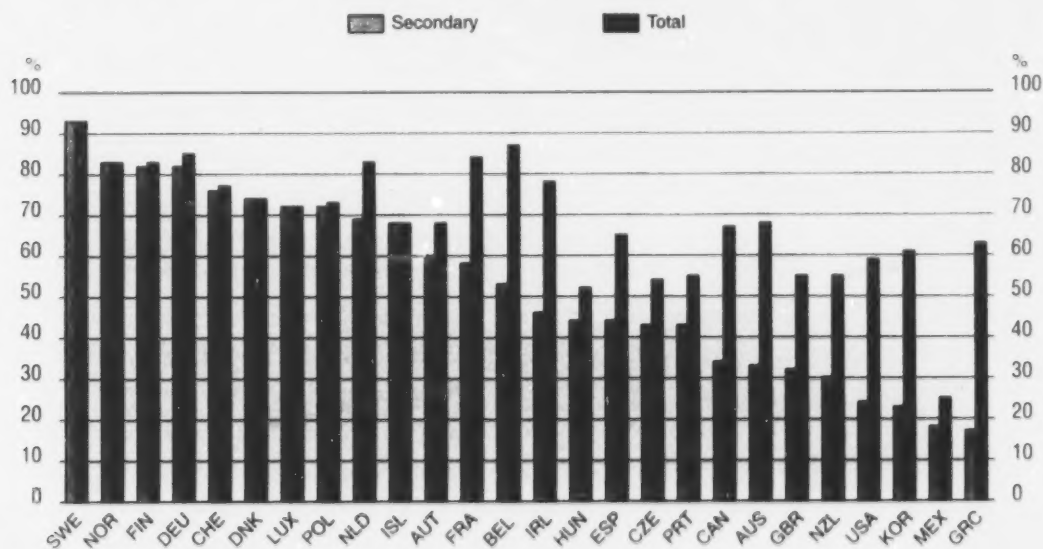
Figure 10. Net secondary and total enrolment rates of 17-year-olds in public and private institutions, 1996



Note: Ranked in descending order of secondary enrolment rates.

Source: OECD (1998).

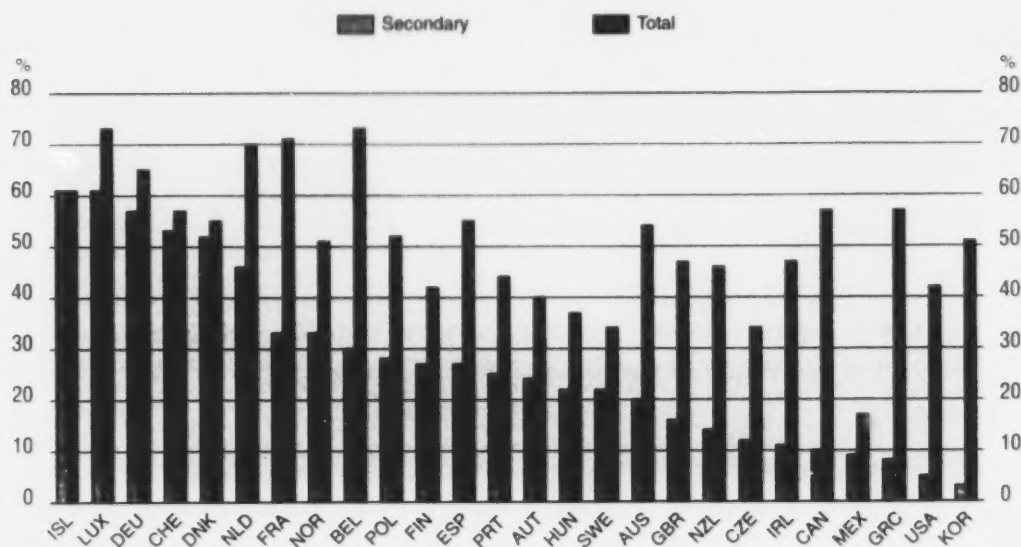
Figure 11. Net secondary and total enrolment rates of 18-year-olds in public and private institutions, 1996



Note: Ranked in descending order of secondary enrolment rates.

Source: OECD (1998).

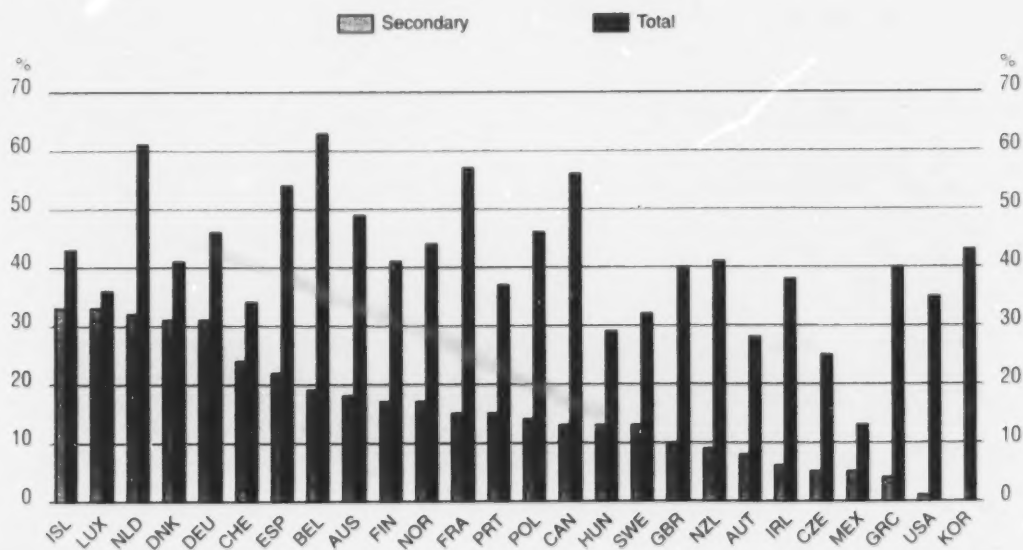
Figure 12. Net secondary and total enrolment rates of 19-year-olds in public and private institutions, 1996



Note: Ranked in descending order of secondary enrolment rates.

Source: OECD (1998).

Figure 13. Net secondary and total enrolment rates of 20-year-olds in public and private institutions, 1996



Note: Ranked in descending order of secondary enrolment rates.

Source: OECD (1998).

Canada have significant non-secondary enrolments) while by age 20 non-secondary education dominates enrolments. However, the proportion of 19- and 20-year-olds still enrolled in secondary education in some countries is noteworthy. Again these figures show wide variation across countries. Some countries have serious difficulties in retaining young people in formal education after compulsory schooling ends, while for a substantial group of countries the enrolment rate is 90% or above. Below we discuss further the trend for staying longer in school in some countries.

b) Objectives and approaches to reform

Within the OECD it is probably fair to say that the Nordic countries have devoted most thought and effort to school to work transition problems. For example, the general approach of guaranteeing to all young people up to the age of 18 or 20 a place in either education or training or work has been developed over two decades and has more recently been emulated, for example, in elements of the New Deal in the UK. These countries have also made strenuous efforts to involve employers and trade unions in programme design and certification. For young people, particularly those under 20, these countries have been successful in keeping students in school for longer than in many OECD countries. For those in their early to mid-twenties, although increasing numbers in this age bracket are still enrolled in upper secondary education in the Nordic countries, a combination of financial incentives and penalties within the welfare system is used to encourage them to enter employment or training.

Although almost all OECD countries have devoted substantial proportions of their welfare budgets to supporting young people who have been relatively unsuccessful in compulsory schooling, and have no realistic prospects in tertiary education, the lifelong learning approach suggests that improving skills and competences within the education system is to be preferred to passive welfare support. The labour market difficulties of young school leavers, which range from unemployment, predominantly part-time employment, or employment in "dead-end jobs" with few training or career development prospects, can usually be traced back to failure or under-achievement at school. Young people without sound basic education (which today includes IT and arguably some competence in foreign language) are not attractive to employers in today's labour market.

So the first objective of reform must be to address the issues of failure and underachievement in secondary schools, as well as early leaving. We discussed above the difficulties of knowing exactly how to achieve improved performance in secondary schooling but also considered some promising approaches. Our discussion of ECEC also suggests that subsequent failure and underachievement may be rooted in the early years of child development, implying that an effective indirect approach is to improve the quantity and quality of ECEC provision.

Policies to improve achievement in secondary schooling should also help in retaining students in the educational system. To achieve both goals it is necessary to confront the problems of low educational expectations and to work to instil greater awareness of the benefits of staying on. There may be, in addition, purely financial reasons for early leaving where students come from low income households which are unable to incur the opportunity cost of foregoing labour market earnings. As the young people in question will come from relatively disadvantaged backgrounds, and because we know that early leaving will, for many, result in lower lifetime earnings, there are strong equity arguments for devoting resources to increasing the staying on rate.

Reform of school to work pathways is predicated on the notion that it is undesirable and unnatural to treat learning and work as separate universes; to do so makes the transition from one to the other more difficult. Upper secondary schooling, in particular, but also tertiary education to some extent needs to address issues of integrating learning and work, while not becoming too narrowly vocational (which would make graduates from formal education institutions vulnerable down the line when job requirements change, as they are certain to do). Formal education needs to provide foundations on which more specifically job-oriented labour market training can build. It is sensible to have a division of labour, but educational institutions need to be sensitive to the way labour markets are evolving. Of course many OECD countries are already grappling with these issues and we will refer to some examples of what would appear to be good practice.

Apprenticeships

Although apprenticeships are also important in Australia, Austria, Norway, the UK and the US, the basic model still held up for possible emulation is the German apprenticeship system. Certainly, the evidence suggests that German youth have benefited from the system (as evidenced, for example by the fact that Germany has consistently had lower youth unemployment than OECD or EU average rates). The German system appears to suffer less from the Achilles Heel of most such schemes, namely that they are regarded as second class by young people, their parents and even employers. This system has succeeded in motivating students to do well in order to secure desirable apprenticeships and inducing firms to provide training opportunities and in doing so has broken down artificial barriers between the worlds of work and learning. Nevertheless, even in Germany (and other countries with traditional apprenticeship schemes), there has been some falling off in their popularity, both among young people who appear to be put off by the difficulty of transferring into tertiary education, and with firms which have been more reluctant to offer apprenticeships as the German economy has encountered (relative to its "miracle years") difficult conditions. Finally there is a growing recognition that the German system cannot simply be transferred to other countries.

The institutional foundations, forms of social partnership and levels of government regulation which have enabled the German system to succeed do not exist in all countries which might wish to adopt a German style apprenticeship system.

Financial support to prevent early school leaving

This can be attempted by a number of policy instruments. Maintenance grants for upper secondary pupils are one possibility. Sweden and Norway have study grants available to different types of student, and Austria also has means tested grants for able students. Other countries (Austria, Finland) have accommodation allowances for students who have to board. Scholarships for needy and able students (Japan), and extending loan systems to secondary schooling (Finland, Japan, Norway) are other methods currently in use.

The use of loans (even where there is an element of subsidy) raises the question of cost sharing at the upper secondary level. While in most countries upper secondary is free at point of delivery (capital and recurrent costs met by state) and other countries provide maintenance support as well, the pattern is not universal. In Japan and South Korea many upper secondary schools charge fees. While increasing overall resources in the upper secondary sector, there has been a price to be paid in terms of equity as high quality upper secondary education has become beyond the resources of some low income families, although, as noted above, this consequence is ameliorated by the use of scholarships. Where apprenticeship schemes exist both firms and pupils contribute directly or indirectly to the costs.

Upper secondary schooling is probably the area where equity and efficiency considerations are most in conflict. As noted, where a decent upper secondary education has become a prerequisite for the acquisition of "good jobs" and access to further education, the equity argument for public funding is really no different than for compulsory schooling. Nevertheless, the fact that individuals themselves reap private benefits (in terms of access to higher education and directly in terms of labour market earnings) and their employers benefit by having access to more highly trained potential employees, there is some case to be made for an element of cost sharing.

Qualifications and curriculum

We discuss later in this chapter, as part of our discussion of how to increase returns to lifelong learning, the need to make qualifications more portable across education types and sectors. Essentially, what is required is double qualification pathways which can provide access to tertiary education and meet job market requirements. Typically such qualifications will involve an element of job experience: apprenticeships, internships and student work projects have all been suggested.

Such pathways may also confer an externality in that by linking work and learning more closely they make students more inclined to seek learning opportunities throughout their working lives.

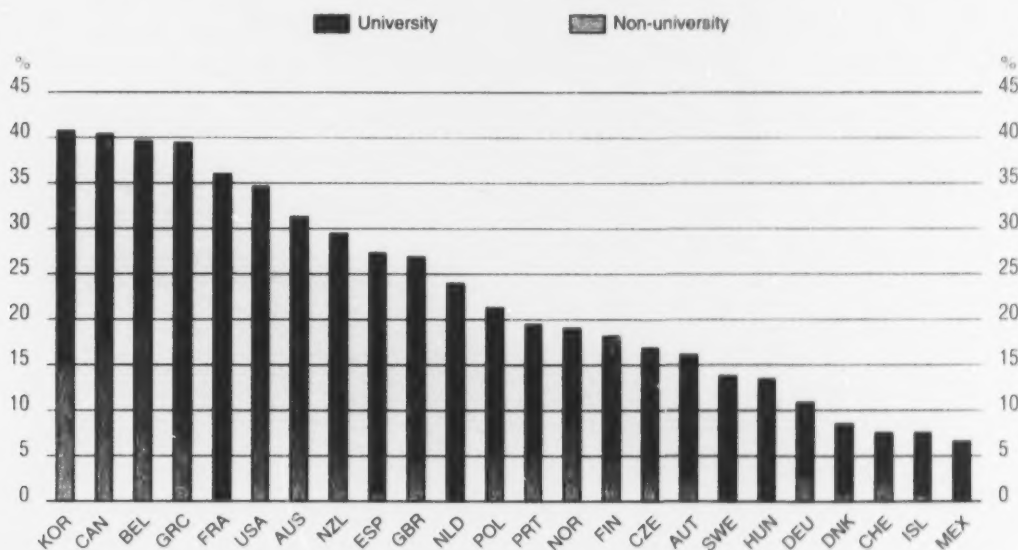
5. Tertiary education

a) Access and funding: background

In most OECD countries tertiary education is no longer an elite activity. Large proportions of the age group are enrolled, and there is near parity in enrolment by gender. Nevertheless, within this overall picture there remain substantial differences across countries in proportions of the age groups enrolled in tertiary education as Figures 14-16 show. For example, for 18-21 year-olds enrolment rates in non-university and university tertiary education vary from over 40% to under 10% of the age group with the standard deviation being exactly one half the mean value.

Once again we observe substantial cross-country variation in enrolments across countries. For 18-21 year-olds, low tertiary enrolment may reflect the fact that substantial numbers are still in secondary schooling. Thus, although Denmark has low tertiary enrolments of 18-21 year-olds (under 10%) we recall that over 50%

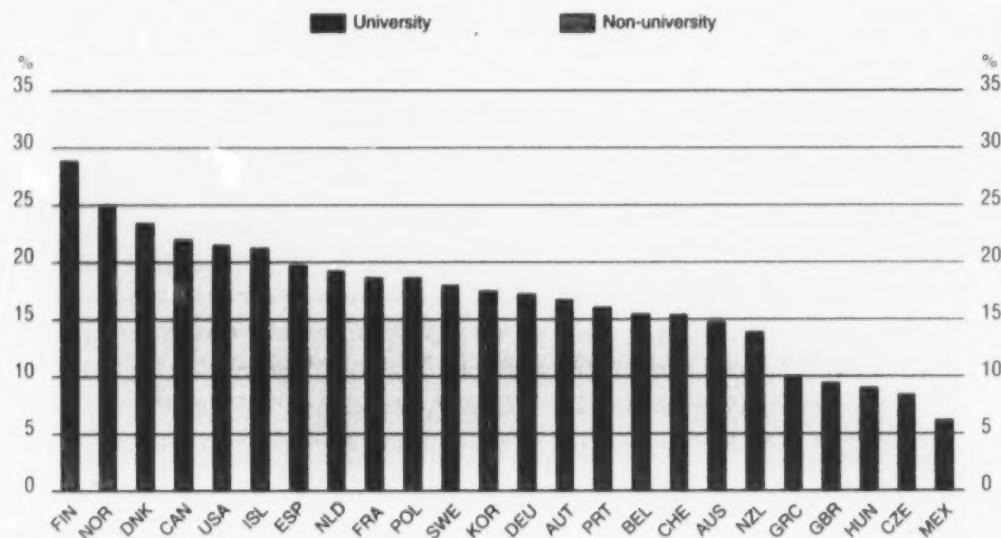
Figure 14. Net enrolment rates for 18-21 year-olds in public and private tertiary education, 1996



Note: Where no non-university enrolment is shown, the category is inappropriate or the data do not distinguish between university and non-university tertiary.

Source: OECD (1998).

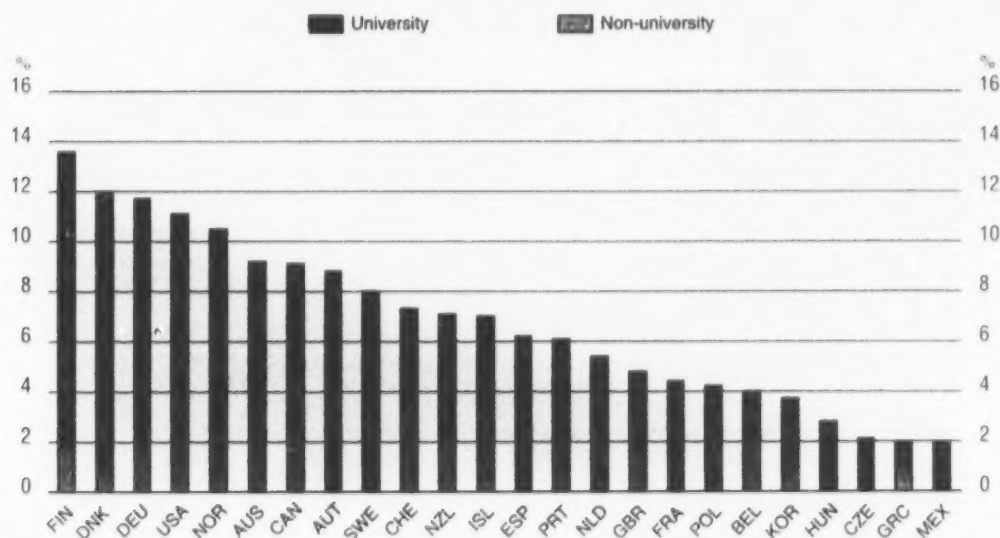
Figure 15. Net enrolment rates for 22-25 year-olds in public and private tertiary education, 1996



Note: Where no non-university enrolment is shown, the category is inappropriate or the data do not distinguish between university and non-university tertiary.

Source: OECD (1998).

Figure 16. Net enrolment rates for 26-29 year-olds in public and private tertiary education, 1996



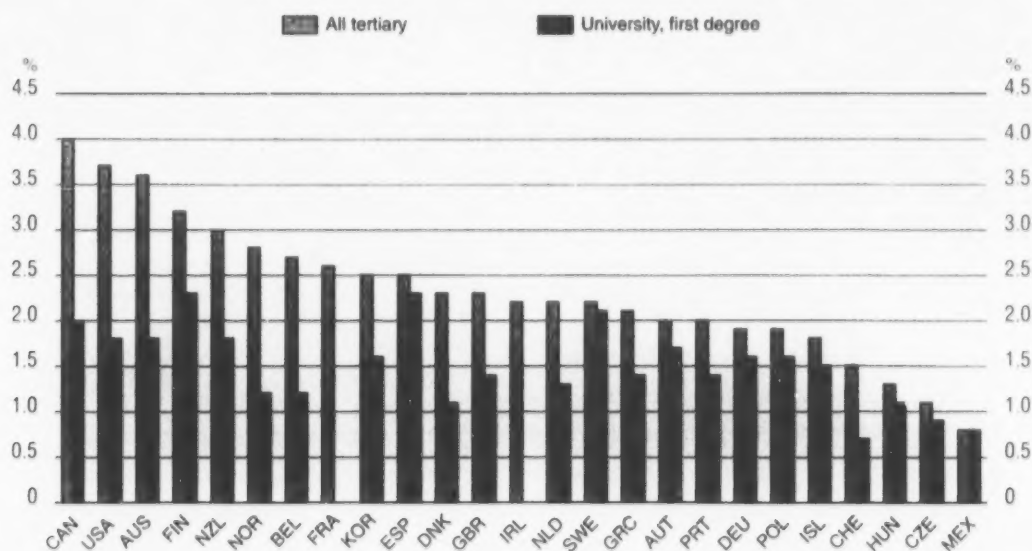
Note: Where no non-university enrolment is shown, the category is inappropriate or the data do not distinguish between university and non-university tertiary.

Source: OECD (1998).

of Danish 19-year-olds are still enrolled in secondary education and over 30% of 20-year-olds. When we look at tertiary enrolments for ages 22-25 Denmark has the third highest figure (nearly one-quarter of the age group). These difficulties of interpretation notwithstanding, the figures show large cross-country differences in tertiary enrolments.

Enrolment figures reflect both participation rates and the length of time people spend in tertiary education. Figure 17 shows, perhaps more clearly, the extent to which countries differ in the tertiary education received by young people; it shows the expected years of tertiary education for all 17-year-olds.⁶ On average, across OECD countries, this turns out to be 2.33 years. Again, the variation is substantial; in Canada and the US the average 17-year-old expects to complete nearly four years of tertiary education while for a large group of OECD countries, including the UK, Sweden, Denmark, Austria, Greece and Germany, the expectation is less than half that while in the Czech Republic and Mexico the expectation is only about one year. Another notable feature is that countries where the expected years of tertiary education are greatest tend to be the countries where non-university education is important relative to university education. Countries that are able to offer a greater variety of types and durations in general succeed in providing their young people with more tertiary education.

Figure 17. Expected years of tertiary education for all 17-year-olds, 1996



Note: No distinction is made between full-time and part-time years. Expected years depend on the duration of tertiary studies as well as participation rates.

Source: OECD (1998).

What the figures conceal is that within all OECD countries, albeit to different extents, participation is heavily dependent on family income and other socio-economic indicators. Table 10 documents this inequality in Britain, by way of example.

Table 10. **Unequal access to higher education in Great Britain**

Socio-economic group	Participation rates in higher education (1997/98)	Percentage shares of university entrance (1999)
Professional	80	13.4
Intermediate	49	39.0
Skilled non-manual	32	12.0
Skilled manual	19	14.4
Partly skilled	18	7.4
Unskilled	14	1.7
Unknown		12.1
All	34	100.0

Source: Greenaway and Haynes (2000).

Nor, in general, is there a pronounced trend towards greater equality as Table 11 illustrates for selected countries. Only in the US have participation rates of the low socio-economic groups grown faster than the average growth rate. Even here it is difficult to be absolutely sure that the data do establish this trend. High year-to-year fluctuations in US participation rates make growth rates sensitive to the period over which the trend is measured. While changing the period of analysis and/or using moving averages does not affect the broad conclusion that only in the US do we observe falling inequality, growth rates of participation by socio-economic group are sensitive to such changes.

Table 11. **Growth in participation rates of young adults in tertiary education by socio-economic group**

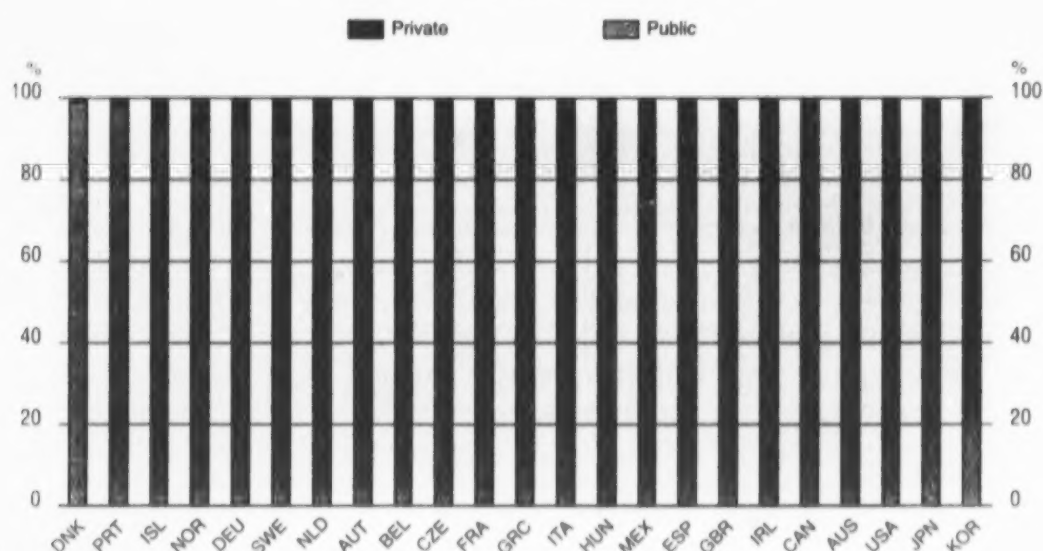
	Years covered	Annual average percentage change	
		Total	Low socio-economic group
Belgium	1985-1992	1.6	0.7
France	1982-1993	1.2	0.6
Ireland	1986-1992	1.8	1.5
Japan	1990-1996	1.0	0.6
United Kingdom	1991-1997	1.8	1.0
United States	1990-1996	0.9	1.2

Source: OECD (1999).

Outside the US the pattern of participation by socio-economic background has not changed greatly. If anything, as the table shows, inequality has increased.

In terms of sources of funding a wide variety of funding schemes exist, and we do not even attempt to summarise them here. To give a broad indication of the diversity, Figure 18 shows the proportion of public and private funding of tertiary education in 1997.

Figure 18. **Distribution of public and private sources of funds for tertiary education institutions, 1997**



Source: OECD (2000).

While on average just over three quarters of tertiary educational funding is public, there is wide variation. In the Scandinavian countries, Portugal, Iceland and Germany over 90% of tertiary funding is public; in Australia, North America, Japan and Korea 40% or more of total funding is private. Currently, the mix of government funding and the fee contribution made by students varies quite substantially across OECD countries. In Japan and Korea students make substantial contributions (given the preponderance of private universities). In Sweden and the Czech Republic, there are still no fees in higher education institutions, while in Holland fee income only accounts for 6% of university funding. Other countries, such as the UK, may be said to be in a transitional phase where the proportion of funding derived from fees has recently increased and the possibility of still further increases is being actively, and sometimes vituperatively, debated.

6) Access and funding: reform

Most OECD governments subscribe to the goal of accelerating the process of transforming participation in tertiary education from an elite to a mass activity. Given the large (and growing) private economic benefits of such participation, extending access is a relatively uncontroversial objective. At the same time, increases in private returns have strengthened incentives both to the traditional tertiary intake and adults without higher education to enrol. Enrolment rates in tertiary education in the OECD rose by an average of 40% in the first half of the 1990s (OECD, 1999) including a growing number entering in their late twenties or older, either because they missed out when they were younger or coming back for additional higher education. The numbers of such "second chancers" and "second biters" can be expected to grow in the future if a lifelong learning culture really takes hold in the adult population. Improved upper secondary completion rates, and, in some countries, growth in the relative size of the tertiary-aged cohort, have reinforced the increased private demand.

However, it is not clear that governments have thought through the funding implications of meeting increased demand. Can major expansions and extending access to currently underrepresented socio-economic groups be financed from general taxation, given other demands on the public purse and pressures to contain or reduce public expenditure relative to national income? Where the answer is in the negative, two possibilities exist, given that governments are also concerned not to allow major deterioration in the quality of higher education. The first is to seek efficiency savings (productivity gains). If these are substantial it is conceivable that existing funding levels could support higher enrolments. In the UK, for example, real funding *per student* declined by about 50% in real terms over last 20 years. At the same time, regulation has increased dramatically and accountability reviews have proliferated. Arguably, all this has led to increased productivity (the austerity measures and increased workloads have even led to limited adoption of new technologies in traditional universities, normally somewhat resistant to technical change), but many would question this. There is no doubt that student-staff ratios and class sizes have increased. Academics report that they work harder while their pay has fallen relative to comparable non-manual groups and to academic pay abroad (in the US especially). Efficiency probably has increased but there can be little doubt that continuation of these trends will eventually affect the quality of teaching and research and create problems for the hiring and retention of academic staff of the highest calibre.⁷ This makes the second option, reform of financing mechanisms, a high priority.

In the context of this paper, reform of the financing of tertiary education is seen as freeing up some public funds and thus contributing to the overall resources available to be spread across the many initiatives that a comprehensive lifelong learning

strategy entails. Within the context of tertiary education, additional objectives of reform include (Greenaway and Haynes, 2000):

- Reducing social exclusion.
- Enhancing the resource base of tertiary education.
- Promoting greater diversity and innovation among educational providers.
- Increasing efficiency in provision.

Many proposals for the reform of tertiary funding exist. These include graduate taxes, vouchers and income-contingent loans. All have their merits and shortcomings. We do not advocate vouchers here. Although they may generate greater efficiency by distributing public funds to individuals rather than institutions (which would then face competition and become more responsive to "consumer demand") vouchers do not, in themselves, generate additional resources.

So, to achieve the triple aim of reducing the public input into tertiary education, expanding access to the system and maintaining or improving quality, additional private funds must be mobilised to supplement and to some extent replace public expenditure. Greater cost sharing is required. While some extra contributions will continue to come from the families of students, over-reliance on this source will perpetuate the current patterns of unequal participation in higher education. Reform of tertiary finance consistent with achieving the objectives above is likely to involve two additional elements:

- *Greater fee differentiation* between institutions to reflect their different locations and mix of activities, between subjects to reflect their different costs and between students to reflect their different backgrounds. In the US, with a large private sector fee differentiation has existed for many years. Other OECD countries have recently introduced differentiation in some dimensions, for example in Australia tertiary fees vary by subject. In New Zealand the shift to a "demand-driven" student-choice model has shifted the onus of fee-setting to providers of tertiary education; the level of fees is one dimension in which institutions compete for students. Many OECD countries also have differential fees for some groups of overseas students. The basic advantages of differentiation is to augment total fees, and make institutions more sensitive to fee paying consumers while allowing them to charge fees which are related to their particular cost structures.
- *Shifting support mechanisms* from a system of non means-tested grants to a mix of means tested grants, more generous scholarships and income-contingent loans (loans based on the ability to pay principle; actual repayments depend on the post-graduation income of the borrower). These financing arrangements take the financial pressure off students while in higher education.

Of course it can be argued that poorer countries will find it difficult to match the US in terms of the availability and generosity of scholarships available to poorer students. Not only is the US more affluent, but there is a tradition of philanthropic giving to higher education which may be lacking in other countries. In the US scholarships have enabled poor but able students relatively easy access even to the most expensive universities. Almost half of Harvard students and 40% of those at Princeton, Yale and Stanford receive financial aid. On average such assistance amounts to a 40-50% discount on student costs. It will be difficult for other OECD countries to match these figures from private sources. Endowments, charities and employers can be asked to contribute more, and over time they may be expected to do so. But the unconstrained ability to set fees also contributes to the ability of these elite institutions to offer generous assistance to poorer students; increased fees themselves increase the scope for redistribution.

Income contingent loans can be thought of as a mechanism for currently drawing on some of the future private returns (i.e. borrowing against future earnings), repaying only when and if they can afford to. Of course there are many details which need to be considered. Should loans and repayments be administered by private sector financial institutions or via the tax system? Should students be able to borrow only to cover fees or should they be permitted to borrow for maintenance as well? Should interest be paid, and if so at what level (UK loans only require repayment of the principle in real terms)? New Zealand is one OECD country that now has a genuine income-contingent loans scheme by which students can finance not only tuition but maintenance, although means-tested student allowances to cover living costs are available for low-income students.

One transitional problem for countries switching to a loans system is that there are considerable up-front costs; it takes time for repayments to accumulate and the system to reach long-term break-even (or whatever long-term target has been set). One possibility for generating an immediate injection of resources would be to sell outstanding public sector student loans to the private sector (securitise the loans). Selling these outstanding debts to the private sector each year generates ongoing government savings.

The argument for requiring students to bear a higher proportion of the costs rests on the substantial financial benefits they receive from tertiary education. In spite of some serious technical problems associated with pinning down these benefits accurately (how much of the higher earnings of graduates are due to tertiary education and how much to intrinsic ability, family background factors, etc.), few doubt the gains are substantial. For example, relative to earnings of those with upper secondary education only, the earnings of women aged 30-44 are 24 and 61% higher for women with non-university tertiary and university tertiary education respectively. The corresponding earnings gains for men are 18% and 57% (OECD, 1999). Comparing private costs and benefits to estimate rates of return, a very wide range of studies exists

showing high private rates of return both absolutely (in excess of 10%) and relative to alternative investments available to individuals. On equity grounds there is no justification for subsidising these high returns to individuals from relatively privileged backgrounds out of general taxation. These subsidies represent, on average, redistribution from low to high-income households. This is not to deny that there may be sub-groups within the tertiary education population for which the returns are low or for which the subsidy is genuinely redistributive. Furthermore, as the tertiary population grows, it seems likely that at the margin it will be necessary to attract young people from less privileged backgrounds. On equity grounds it will be important to monitor reforms of tertiary financing to ensure that they do not create access problems for such groups. This point is taken up again shortly.

The arguments for state financing should, in principle, depend on market failure and equity arguments (although, as in other areas of public expenditure, history and tradition have probably been as important in determining actual financing modes). However, these arguments have not been particularly well made. In particular, the externality arguments claiming that higher education confers on society in general a layer of additional returns over and above those captured by graduates, have usually been asserted rather than proved. Another body of literature relates higher education to overall economic growth, see for example Temple (1999). Paradoxically, where externality and public goods arguments are perhaps most plausible, in the area of university research, private funding has grown most rapidly. This is partly due to governments making their own research funding contingent on raising private finance. Nevertheless, it is likely that for a combination of such reasons society does benefit from higher education over and above private returns, but there are no sufficiently reliable or robust estimates on which the optimal financing contribution out of general taxation could be determined. The fact remains that the bulk of the benefits are captured by individuals. They could, therefore, be asked to bear a greater share of the costs.

The suggestion that greater cost sharing in tertiary education is likely to form part of the financing strategy for lifelong learning reflects trends that are already observable in many OECD countries. Thus, between 1995 and 1998 nearly one half of OECD countries reported an increase in private spending on tertiary education institutions of more than 20%. In over half the countries for which the comparison can be made the private share of funding has increased, very substantially so for some countries (notably Italy and Hungary). It should be noted, however, that an increase in the private share does not mean that public spending on tertiary education has decreased. In all but three of the countries for which the comparison can be made, public spending has in fact increased. There is some evidence that countries with the highest growth in private spending also have the largest increases in public spending; the two sources of funds are complementary.⁸

The crucial question is whether reforms of the type suggested, even where the repayment of loans is income contingent, would deter enrolment, particularly the enrolment of children from disadvantaged backgrounds. Advocates argue that this should not happen because *a*) there will not be increases in up front expenses, as these will be covered by loans and scholarships, and *b*) because loan repayments are income contingent – repayments should never become burdensome relative to income. Furthermore, the inequality of access in many countries under current funding arrangements suggests that factors other than costs are at work in deterring participation by children from disadvantaged backgrounds in tertiary education. Nevertheless, the effect on participation can really only be determined empirically. Surprising little research exists which carefully examines the effects on participation in tertiary education of changes in the full direct and indirect costs actually borne by students.

Even in the US, which has by far the largest proportion of the age group in tertiary education, and one of the most effective systems for providing financial support for able students from low-income backgrounds, participation in college education, as in other countries, is strongly correlated with family income. If financial constraints are not the major factor in determining the pattern of participation in tertiary education in the US, the explanation must be sought elsewhere. Family and environmental factors are a strong candidate. Of course, environmental factors and borrowing constraints may *both* affect tertiary participation, but where family and environment provide the necessary preparation for successful tertiary education, simply relaxing the financial constraint by grants or subsidised loans to students from low income families may not be particularly effective. Helping families to provide the environment conducive to earlier development of scholastic aptitude would be more effective. Some evidence suggests that by the age of about 14 scholastic ability is largely determined, although malleable at earlier ages. The importance of family and environmental factors in determining educational success has of course been known for some time [Coleman *et al.* (1966) highlighted their importance, relative to school expenditure, in determining successful compulsory schooling]. A recent empirical test using US data is contained in Cameron and Heckman (1998).⁹ They argue that scholastic ability, for which they have a test score measure, is the product of family and environmental factors, both of which are themselves in part determined by family income. They then estimate the effects of different factors affecting the probability of attending college. On its own, family income plays a big contributing role. But when pre-college scholastic ability is included as an extra explanatory factor, the importance of family income is drastically reduced.

They conclude from this that family and environmental factors, as embodied in the scholastic achievement score, are the driving forces in explaining college attendance. If short-term credit constraints were binding, then the effects of family income would not be so drastically diminished simply by including scholastic ability

as an extra explanatory factor. In terms of policy, the implication is that interventions later in life, subsidising college for poor students for example, will be far less effective in promoting wider access to tertiary education than policies that intervene at much younger ages. The focus of such policy should be on building up scholastic ability, motivation and attitudes that predispose individuals to attend further education. This is not to say that financial constraints never matter. For some individuals in some countries they undoubtedly do. However, at the margin it will often be the case that more cost-effective means exist for improving access to tertiary education.

Of course, one needs to enquire further why it is that prospective students to US higher education are not resource-constrained and whether the same would hold in other countries if they reformed tertiary financing in the direction of greater cost sharing. Evidence that family and environmental factors play a major part in participation decisions can take a number of forms. At a general level the US experience is constructive. Yet, it can be argued that factors unique to the US explain why financial constraints are rarely binding on the participation decision. This is firstly because the existence of open access to two-year community colleges provides relatively cheap access to further education both in terms of opportunity costs and in terms of direct costs such as tuition fees and accommodation (many students in such colleges live at home). For students wishing to attend the elite four-year universities generous loan and aid programmes exist which are targeted at children from less affluent backgrounds. Further factors reducing the financial barriers to higher education participation in the US include the modular system which makes it easy to take breaks in study and to transfer, if need be, to cheaper institutions and a plentiful supply of part-time employment. Where such institutional factors are absent, shifting a greater share of the costs of higher education to students or their families could discourage participation more than it would appear to in the US. To put it another way, there is a strong case for accompanying funding reform with institutional reform designed to increase the range of institutions and qualifications on offer. The Austrian *Fachhochschulen* (established in early 1990s to offer shorter more vocational courses than universities) is but one example. The classical research-based universities will, of course, survive, but there is a growing realisation that the "one size fits all" model is not appropriate. Furthermore, institutional diversification may reduce costs per student in the sector, if only because some non-university tertiary institutions have shorter courses.

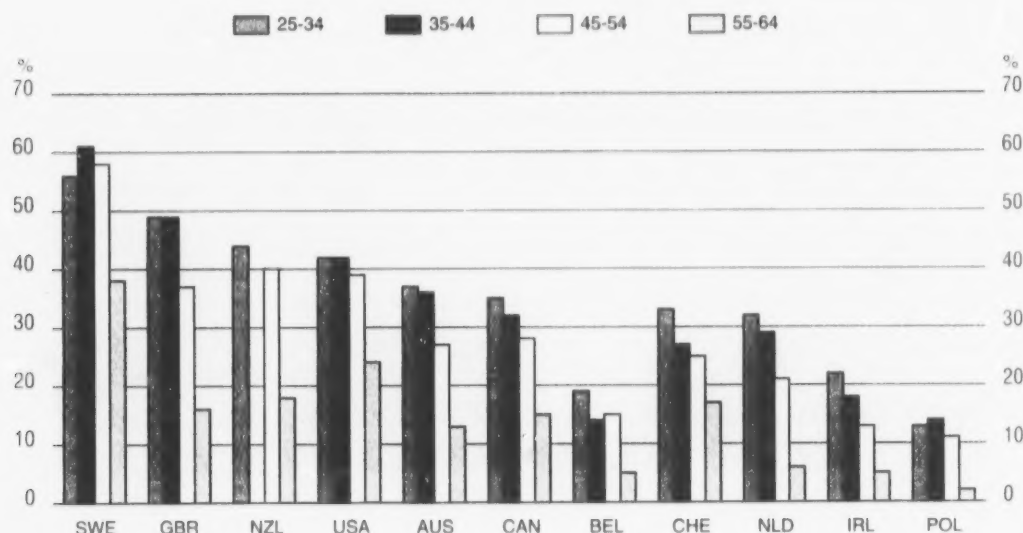
6. Public and private sector training programmes

a) Empirical background

The very diversity of types of job-related training for adults makes it difficult to provide a clear picture of the provision in different countries (the problems here are similar to those of documenting ECEC provision). Given the variability in intensity and quality, participation figures serve as a first approximation only (Figure 19).

82

Figure 19. Percentage of 25-64 year-olds participating in job-related¹ education and training, by age, 1994-95



1. For Sweden, the percentages relate to all education and training, not just job-related.
Source: OECD (1998).

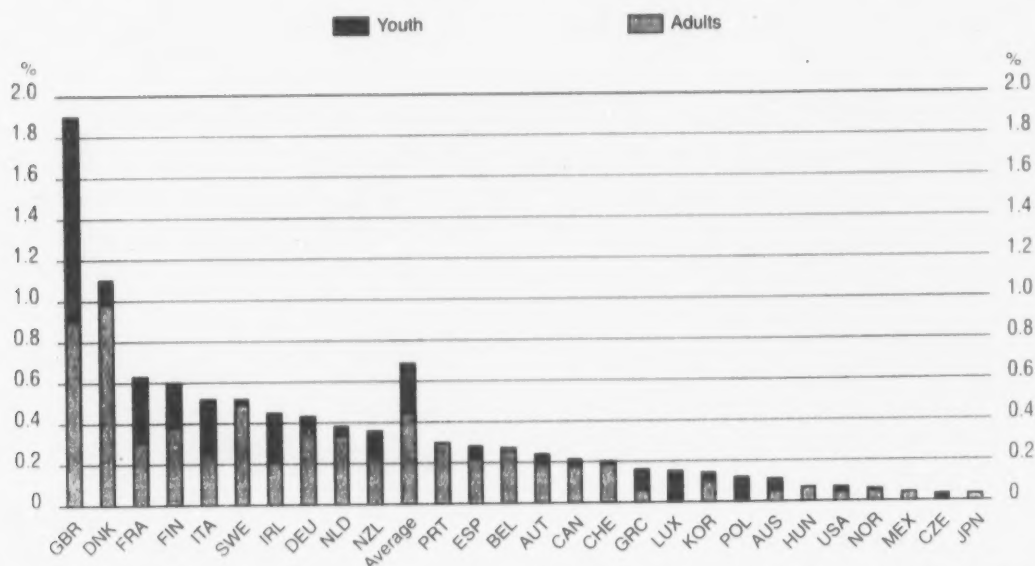
Not only are the country differences notable but, in general, the levels are quite low, given the wide definition of education and training. Only for Sweden does half the working aged population receive such training. For most of the OECD countries surveyed 60% or more of the workforce do not receive training. Except in Sweden and Belgium, men receive more training than women, but the discrepancies are not generally very large.

Figure 20 uses training expenditure as percentage of GDP to examine the public sector training "effort" across countries. The figure breaks down this expenditure (where possible) between adult training (for the employed and unemployed) and youth measures (training for unemployed and disadvantaged youth and support of apprenticeship and related forms of general youth training).

As in the enrolment measures, there is very substantial variation indeed across countries in the expenditure share of national income devoted to active training measures, and also in the emphasis given to youth versus adult training. This certainly suggests that this component of lifelong learning is one where low provision countries need to review their commitment.

Figure 21 documents the well-known tendency for those with more formal education to receive more job training as well. Except in Sweden, fewer than 30%

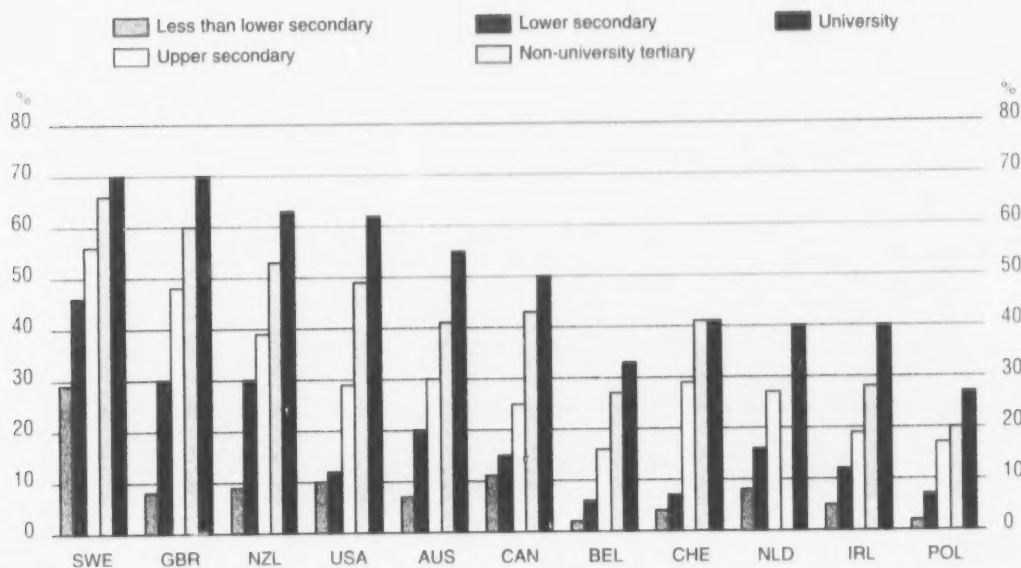
Figure 20. Public expenditure as a percentage of GDP on labour market training, 1999¹



1. Belgium, France, Korea, Poland, Portugal, Switzerland, United Kingdom: 1998. Greece, Luxembourg: 1997. Ireland: 1996.

Source: OECD (2000).

Figure 21. Percentage of 25-64 year-olds participating in education and job-related¹ training, by education level, 1994-95



1. For Sweden, percentages relate to all education and training, not just job-related

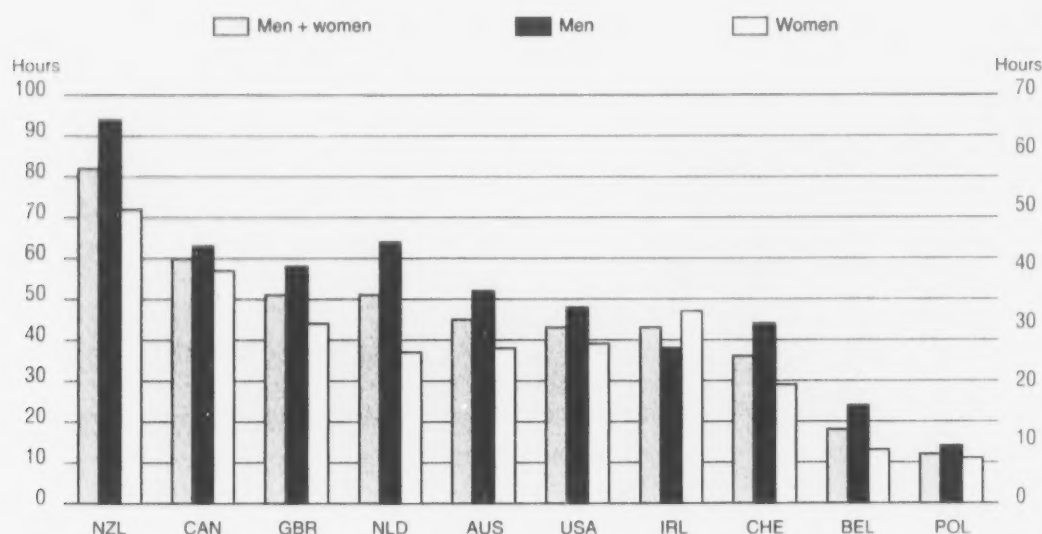
Source: OECD (1998).

of those with less than upper secondary schooling participate in training. In every country the increase in participation at successively higher levels of formal education is marked. There are (at least) two possible explanations; either formal education and job-related training are complementary so that the former enhances returns to, and hence participation in, the latter, or some unobserved characteristics (ability, motivation) determine participation in both types of human capital formation.

When we examine the incidence of training by age we do not observe great differences in most countries up to the age of 44, but, thereafter, training falls off rapidly, especially for the 55-64 year-old age group. We defer further discussion of the plight of older workers until Section 7.

Finally, when we multiply participation by hours per participant we find the average training hours per adult (Figure 22). Unfortunately hours data are lacking for Sweden so we have a more restricted group of countries. Nevertheless, we see that the ranking of countries changes somewhat (Canada does better, the Netherlands worse). It would also seem that these annual training hours are quite low, but to assert this meaningfully we would need some yardstick for adequate training, which we do not have.

Figure 22. Mean numbers of hours per adult¹ of job-related education and training, 1994-95



1. Mean number of hours per participant multiplied by participation rate, ages 25-64.

Source: OECD (1998).

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b) Evaluation: what works in public sector training?

There is, of course, an enormous literature on the effectiveness of individual job training programmes.¹⁰ In addition to monitoring the effects of specific interventions, this literature has sought to advance the science of programme evaluation.¹¹ Evaluation is difficult for some of the same reasons raised in the discussion of ECEC. For small demonstration programmes we do not know how to extrapolate results to larger populations or differently targeted populations. Even where programmes are successful, we rarely have sufficient variation in the data to know what components of the programmes (*e.g.* the classroom or on-the-job components) generated this success; vital information for designing more effective training as part of a lifelong learning strategy. This is not the place to review this literature in depth, but rather to attempt a very brief summary of what we know and to ask whether this knowledge suggests whether job training is a likely candidate for forming a central plank of a lifelong learning programme. It is difficult to generalise about the effectiveness of training because:

- Results vary across types of programme and across countries (much of the evaluation relates to the US and Canada, although European countries are starting to do more effective evaluation than in the past).
- Results vary across sub-groups of participants in training programmes.
- Results vary by evaluation criteria. Usually evaluation looks at the post-training earnings and employment records of participants. So far there has been little evaluation of the types of social outcome (reduced criminal activity, for example) that we showed to be important in ECEC evaluation.
- Estimating deadweight, displacement and substitution is intrinsically difficult.

Nevertheless we can say something. It is crucial to distinguish between private sector and public sector training programmes. The literature suggests the former are more effective, with rates of return clustering in the 10%-20% range, while very few public sector training programmes produce rates of return approaching 10% (Heckman, 1999), a possible exception being the US Job Corps programme. Of course, one is not really comparing like with like when comparing private and public training. There is a selection bias at work. Private sector trainees are more likely to benefit because they have been selected by employers or are self-selected. They are typically higher skilled to begin with than trainees in public programmes. Because of complementarities between types and levels of human capital, it will be the case, on average, that even within the group of employees the more skilled will attract and undertake more training. Both the training (because firms are better attuned to market requirements and changing skill demands than government agencies) and the trainees are often higher quality in the private sector. It is not generally profitable for private firms to make major efforts in training low skilled and disadvantaged adult workers.

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For these reasons training and retraining of these more vulnerable groups tends to be left to public sector training programmes. Of course, there is much heterogeneity of outcome depending on the particular target groups (adult men, adult women, youth, displaced older workers) and on the nature of the actual programme. As a generalisation, one gets what one pays for; cheap and short programmes will have low or negative returns while more intensive, and expensive, programmes will have better results. Overall, however, the weight of the evidence suggests that such programmes have only modest, and not always permanent, impacts on earnings, employment probability, poverty and other programme goals. The group most likely to gain from public sector training programmes is adult women; adult men on average profit less, while the results for youth training are almost universally disappointing. Where different programme characteristics can be independently evaluated, it appears that strong links with local employers and a major on-the-job component are associated with success.

Due to the sheer heterogeneity of existing provision and the difficulty of formulating precisely what adequate, let alone optimal, provision would look like, adult learning and training is probably the most difficult sector to analyse and for which to make clear recommendations. Yet, this is precisely the area that most people have in mind when they think about lifelong learning. While job-related training is poorly funded by the state (relative to formal education and ECEC) it is far from clear what the appropriate role for public funding should be. The reality is that the state has assumed responsibility, by default, for the learning needs of those that private employers are unwilling to finance: the unemployed, the poorly educated and, in some cases, the older workforce.

In Chapter 3, we considered the incidence of on-the-job training costs borne by employer and employee, showing how the standard Beckarian analysis required modification in the light of market failures. It is difficult to know whether current levels of on-the-job training are adequate. The poaching argument suggests that they may not be in the absence of a training levy. Many governments allow both trainees and trainers involved in enterprise-based training to deduct expenses from taxable income; presumably this reflects a belief that the volume of such training would be inadequate in the absence of such subsidies. In Sweden, for example, the state subsidises enterprise-based training where the need arises due to restructuring, or where there is a perceived labour market need over and above the requirements of firms giving the training. As we know that the more educated and better paid receive disproportionate amounts of on-the-job training, we can say that these subsidies are not equity-promoting.

On-the-job training, however, is not the only aspect of lifelong learning for adults. Two other major components are adult general education and job training for the unemployed. Little formal analysis or empirical evaluation exists about now and how much the state should contribute to the finance and provision of the

former, while empirical analysis of training programmes for the unemployed produces very mixed results as discussed above. In general, both adult education and training programmes for the unemployed are funded publicly (usually by local government or a combination of local and central governments rather than by central government on its own) although, especially where adult education is leisure or life-style oriented, a fee element enables some cost sharing. As a generalisation it is probably true to say that adult education has achieved relatively low priority from governments and its funding has been more vulnerable to economic conditions than has been that for compulsory schooling and post-compulsory secondary and tertiary education. Adult education has been particularly vulnerable when governments have needed to reign in public spending. Our analysis of the effects of technical change, sectoral demand and employment shifts and adult illiteracy suggests that lifelong learning strategies should re-examine the low priority currently afforded to this sector.

7. Older workers

a) Empirical background

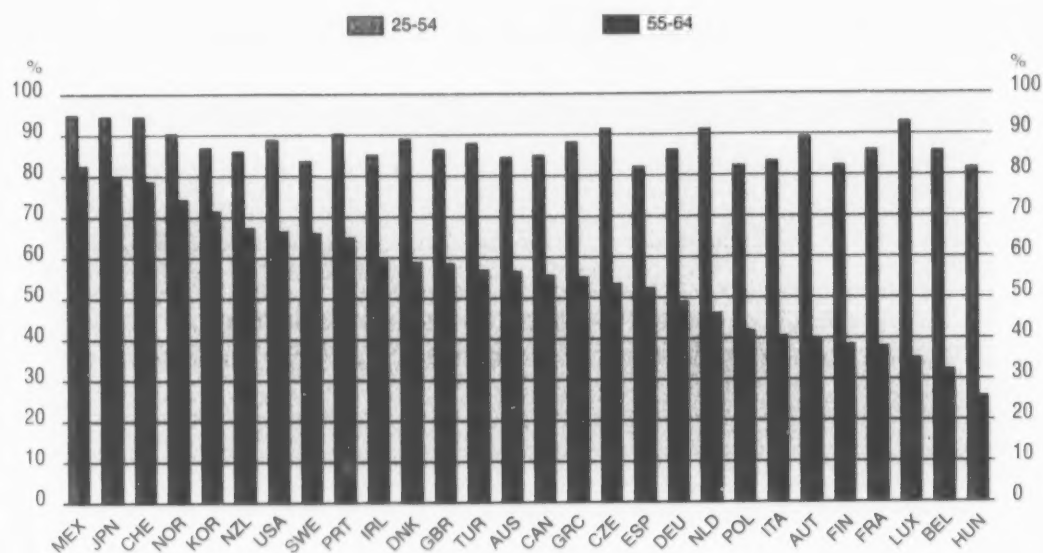
Figures 23 and 24 show that employment rates for both men and women fall dramatically after the "prime-age" employment years (25-54).¹² In only a handful of countries are more than 70% of men or 60% of women over 55 in work. Of course, the age band 55-64 is a wide one, and a finer age breakdown would reveal a more gradual decline in the probability of employment with age. Nevertheless, it is remarkable, and not widely appreciated, that countries like Germany, Italy and France have less than half of their male population (and less than 30% of their female population) aged 55 and over in work. There are other implications, which we discuss shortly, but in terms of the now familiar discussions of the impact of ageing populations, these low employment ratios contribute to high dependency ratios, increasing the financing burdens of income support and health care for older persons.

The above relates to the current position (as far as data permit). In terms of changes over time both employment rates and labour force participation rates for older men have fallen dramatically over the last twenty years. While it is true that men of *all* ages are now less likely to be in work than they used to be, the reductions have been greatest for older men.

For women, employment rates have tended to *increase* overall, but older women have not benefited from this, their employment rates have remained largely unchanged. Table 12 illustrates both these trends for Britain.

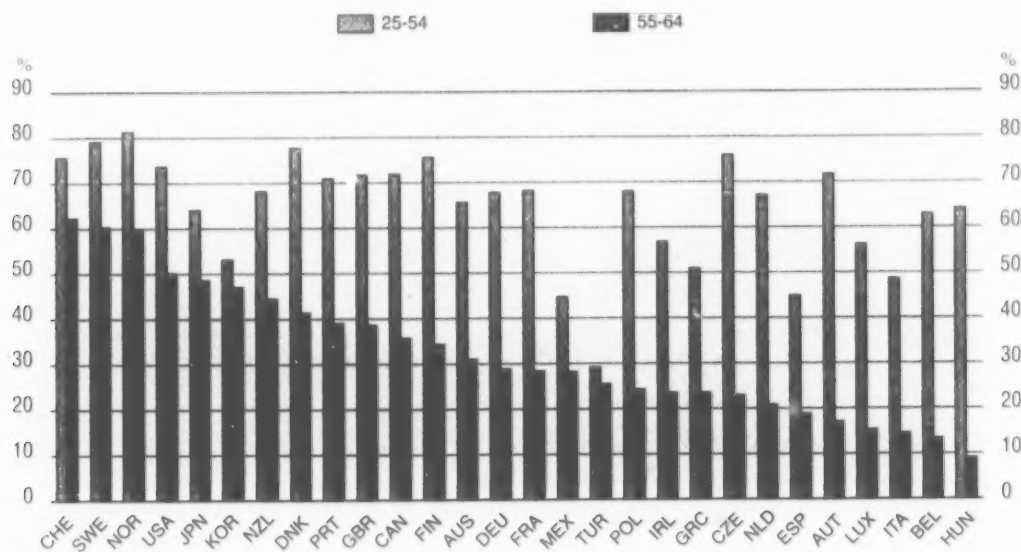
Figure 25 shows that the downward trend in male labour force participation was quite widespread in the OECD for the twenty years up to the mid-1990s.

Figure 23. Employment/population ratios by age, 1998
Men



Source: OECD (1999a).

Figure 24. Employment/population ratios by age, 1998
Women



Source: OECD (1999a).

Table 12. **Employment and labour force participation rates (%),
United Kingdom, 1979 and 1997**

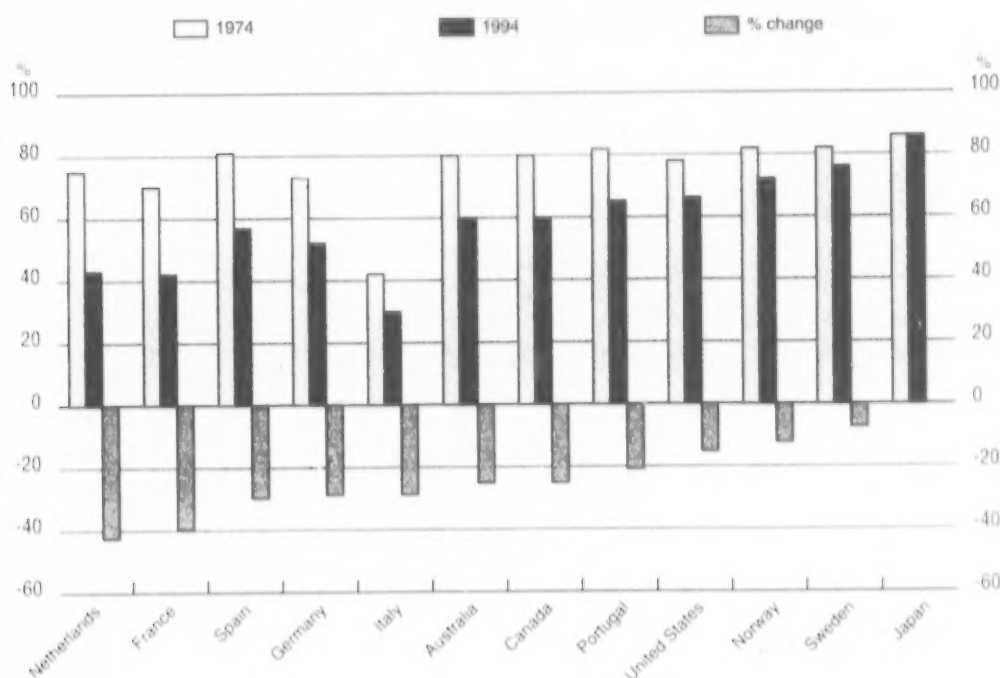
	Men		Women	
	All	Aged 55-65	All	Aged 55-60
Employment				
1979	90.8	79.4	60.2	50.9
1997	80.6	58.3	68.9	50.4
Labour force participation				
1979	95.1	83.2	64.0	53.1
1997	86.7	62.9	72.8	52.6

Note: The figures exclude students, under 18s and persons over state pension age.

Source: Campbell (1999).

The countries are ranked left to right in terms of the size of the percentage decrease, the Netherlands experiencing a massive 43% decline in male participation over the decade and only Japan immune from the trend of falling participation of older men.

Figure 25. **Male labour force participation, men aged 55-64, 1974-94**



Source: OECD (1999a).

There is suggestive but not definitive evidence that the downward trend in male employment may have ceased in some countries (see OECD *Employment Outlook*, various issues); generally it has certainly slowed down. However, there is no current evidence of it being reversed.

6) Policy and lifelong learning implications

Does the decline in employment of older people matter? If so, what is the role for policy and, in particular, what role can lifelong learning play? It is sometimes argued that early retirement is an efficient mechanism for labour reallocation by replacing time serving older workers whose skills are becoming obsolete with more energetic younger workers with up-to-date skills. Leaving aside the question of how much truth this caricature of young and old workers contains, economies which already have high dependency ratios for purely demographic reasons can ill-afford the additional burden imposed by the foregone output of such a large proportion of the potential labour force. In public finance terms, the counterpart to this lost output is the reduction in tax revenue compared to the revenue with higher employment. Where early retirement leads to subsequent old age poverty, the public finances may also deteriorate due to increases in income support commitments.

It seems highly probable that there are lower cost methods of encouraging efficient labour allocation. Furthermore, the argument that the retirement of older workers makes room for younger more productive workers implicitly assumes that there is a fixed amount of employment in the economy. Except perhaps in the very short run this is not true. Aggregate employment increases over time and is ultimately determined by the number of persons who can compete effectively for jobs; if workers are employable there is no fixed number of jobs.

Whether governments should attempt to reverse the trend to lower employment rates for older males and increase the rates for women¹³ depends in part on whether low employment rates are desired by the individuals concerned. Have the reductions in the employment of older persons been voluntary? If so, we could accept that individuals have decided that the benefits of early retirement (the ability to enjoy leisure years while young enough to get the best out of them) outweigh the costs (foregone labour earnings and, possibly, lower pension income). Where reduced employment is not voluntary, on the other hand, older persons could find themselves confronted with poor re-employment prospects and unexpectedly low retirement income. In extreme cases the latter may take the form of social exclusion and/or old-age poverty. Evidence that older workers at the lower end of the earnings distribution have a higher probability of being displaced would suggest that much early retirement is not voluntary.¹⁴ Of course, in practice it is often difficult to know whether early retirement is voluntary. For

¹⁴

example, a person may lose his or her job because that job is no longer needed in their employer's firm. This is clearly involuntary. That person may subsequently reject job offers and or drop out of the labour force because the wage they can command is substantially lower than in the previous job. This second stage is voluntary retirement but the underlying cause is involuntary job loss. Some recent evidence in Britain found that nearly two thirds of men over 50 who retired early did so under compulsion from their employers.¹⁵

To better evaluate the significance of falling employment rates for older workers, we need to examine in more detail the reasons for this trend. One of these could be an increase in labour market discrimination against older workers. Indeed, older workers often claim to feel marginalised at work and in job search. Empirically, however, it is difficult to establish the extent let alone the trend in pure discrimination. To do so one would have to show that workers who are alike in all relevant aspects except age have different labour market outcomes. The problem is that age tends to be correlated with other relevant characteristics such as amounts and quality of education and training, experience, etc.

So, leaving discrimination aside, there are two classes of explanation for recent declines in employment of older persons: skill-biased technical progress (SBTP) and the potential incentives to early retirement embodied in occupational and, to a lesser extent, state pension schemes. The general effects of SBTP were discussed in Chapter 2, but it is worth noting here that older workers are likely to be disproportionately affected. New skills are, not exclusively but to a large extent, introduced into the labour market in successive entry cohorts. By acting as a demand shock favouring younger skilled workers this puts older workers, even skilled older workers, into competition with young unskilled workers. This puts them at an even greater disadvantage than they would experience simply due to the long-term increase in the quantity and quality of education.¹⁶ These effects of SBTP reduce firms' demands for older workers, increasing the layoff risk for the employed and reducing the re-employment probability for the unemployed. To the extent that lower employment rates of older workers reflect these consequences of SBTP, they do not reflect voluntary decisions.

It is difficult to generalise about the incentives to early retirement posed by pension schemes. To their holders, pension rights are capital assets. To the extent that the real value of these assets increases over time there will be a wealth effect. This will induce decreased hours of work, thereby encouraging early retirement. On the other hand, pension schemes where the pension income is related to final salary, added years of work tend to add disproportionately to the pension value,¹⁷ constituting a disincentive to early retirement. Final salary schemes also discourage workers to move from full-time to part-time work. Such "downshifting" to a less-demanding job with the same employer can be encouraged if pension schemes are more flexible in permitting pensions to be calculated on a year, or

years, close to retirement rather than strictly on the final year of work. On the demand side final salary schemes create incentives for firms to create early retirement opportunities. In general, firms have incentives to either impose mandatory retirement to limit pension obligations, or offer early retirement schemes in order to reduce the workforce when faced with cost shocks. Where pension scheme provisions induce firms to encourage early retirement of their workers, the decisions are again not strictly voluntary. Under these circumstances workers may be dissatisfied with the level of retirement income they receive. In the past, state pension schemes in some countries also enabled early retirement, but generosity and eligibility have tended to become more limited as ageing populations increased the financing burden facing governments. Such tightening is likely to continue.

Governments should be careful not to encourage early retirement as a means of cutting labour supply, even in circumstances where they regard such cuts as desirable. It is expensive and in the long run could threaten the sustainability of social security programmes. There is clearly scope to reduce early retirement by changes in state and occupational pension rules. For example, many state pension schemes reduce the pension received when the pensioner has labour market earnings above some level. Reducing this implicit tax would create a substitution effect resulting in an increase in the desired hours of work of older workers. Increasing the deferral rate by which the value of the pension is increased if its take-up is deferred should have a similar effect provided the deferral is not actuarially unfair. In terms of occupational pensions in the private sector, policy would need to discourage firms from using such pension schemes as a relatively inexpensive way of retiring their workers early. One method would be to reduce the tax relief employees often receive on the lump sum component of their pension wealth. Another would be to raise the minimum age for occupational tax relief. Legislating against mandatory retirement would be another possibility, but its longer term effects on employment are far from clear.

Governments could simply subsidise firms to retain older workers, and indeed such subsidies may well form part of a package of measures designed to keep older workers in employment. Unfortunately, this approach is likely to incur large dead-weight costs. Therefore, employment and/or wage subsidies should probably be used in conjunction with enhanced training and retraining to offset the effects of SBTP in shifting demand from older to younger workers. Public training of out of work men in general has low returns, and in the case of older workers they are likely to be even lower. A better approach is on-the-job training. Can such training simply be left to the private decisions of workers and firms? Probably not.¹⁸ Private returns to training for an older trainee are low (see Box 2), primarily due to the relatively short period remaining to recoup the benefits, but also because opportunity costs (lost earnings during training) and risk aversion (uncertainty of returns to training) may be greater for older workers with family or other commitments.